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ORIGINAL ARTICLES

THE IMPORTANCE OF A GOOD TECHNIC*

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WHILE not a criterion as a technician I have been forced, as a result of indifferent work, to appreciate the importance of good technic as it relates to the construction and adjusting regulating appliances to the teeth. No matter what form of appliances is used the results of our treatment will reflect on the manner in which the appliances have been adjusted. We will grant that a band cannot be made only to approximately fit the surfaces of a tooth, but the closest adaptation that is possible to get is the thing to be desired. Whenever a band becomes loose on a tooth it is generally the fault of an imperfect fit rather than the cement that is used; the cement, however, should be of good quality and of a permanent nature. The technic is one of principle and detail and if sufficient time is utilized in the intelligent application of the principles and close attention to details the results are going to be very pleasing and the appliances will be easily cared for during the long course of treatment and retention. The construction of bands requires almost a definite procedure, but differs somewhat in reference to making the measurements. The shape of a tooth should determine the way in which the measurements should be made and each tooth to carry a band should be measured instead of one measurement being used for the same teeth in opposite sides of the arch. The one measurement may be sufficient in most instances, but occasionally there is a difference in the size of the first molars, for instance, that necessitates making the band over. Adopting a definite routine in making bands insures accuracy and increases speed. Variations must be made in securing measurements that are in keeping with the surfaces of the teeth and in their size and shape, including

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the fossæ, developmental grooves, supplemental grooves, tubercles and anomalies of tooth form.

Many men have different methods of adapting the bands to the teeth with a degree of accuracy that is most satisfactory. Some are using seamless bands, others are making up a number of bands for future use and selecting the one that will most likely fit a certain tooth and still others are using clamp bands for the anchor teeth. The thickness and width of band material may be of the following gauges, with some alterations in the case of deciduous teeth and nonprecious metal. The molar anchor bands are .006 to .007 of an inch in thickness and .20 to .22 of an inch in width. For anterior bands .003 of an inch in thickness and .15, .17 and .20 of an inch in width makes a very good selection. Where the maximum amount of strength is not required an easier working band material may be used to advantage, especially in cases of partially erupted, tender and deciduous teeth. The nonprecious metals, due to their oxidizing qualities, tend to irritate and discourage our efforts at a more refined and delicate technic that is essentially required in constructing a mechanism such as the ribbon, lingual, pin and tube appliances.

REGULATING APPLIANCES

It is highly desirable that any regulating appliances should be as delicate as possible and yet consistent with strength, and much care should be given to form and proportions and to the material of which they are constructed. There is seldom a band made and adjusted to a tooth that does not carry a soldered attachment, and where the heat necessary in soldering impairs the strength of the band either by soldering the ends of the band or the tube, arch, etc., and particularly where there is a tendency for the band to oxidize, strength has been sacrificed and the band will soon break. The minimum amount of solder and the right application of heat is essential to good technic. The strain upon bands laterally in rotation, and particularly in root movement, is so great that it would injure the ordinary band of uniform thickness and must be reinforced when the occasion demands it. Reinforcing bands on the labial and lingual surfaces where the strain is great in the region of the attachment and making it thinner where the strain is diffused, as between the approximating surfaces of the teeth is an important advantage in the life of the bands.

SPECIAL BANDS

The generally accepted method of making plain bands is to use a piece of band material long enough so that its two ends may be firmly grasped by one hand and drawn tightly about the tooth after being partially contoured to the desired shape of the labial or lingual surfaces and pinched with band-forming pliers. The cost of the material, especially precious metal, makes it highly desirable to use the shortest possible strips of band material and necessitates some form of instrument or means of holding the two ends while the pinch is being made. There have been some suggestions made, such as uniting the free ends of the band material with solder and using a right-angle ball-end burnisher to exert pressure while making the pinch and preventing the free ends from losing their relation with each other. This plan no doubt is a good one, but it requires

time, and a very good method is to fold the free ends over each other from one to two times and flatten the fold with a heavy pair of pliers, giving the same effect as if soldered with considerable less time consumed. Dr. Angle has devised a pair of pliers for this purpose, but using two pairs of pliers in the mouth at the same time is considerable trouble. Since the band has been well adapted to the tooth and the pinch made, it becomes a question of one of three ways in which the band is soldered; it is either united in the pinch, the solder making it flush with the inner surface of the band before the free ends are clipped off, or the free ends of the band are clipped through the V formed by the pinch in the band and a lapp joint or a butt joint made. It appears to me the lapp joint is the most practical one as it tends to strengthen the band and prevent its opening up while making attachments or at least making it less likely to, and also that it affords a means of tapping the band to place and with a degree of neatness that is impossible to obtain except possibly by the butt joint.

POSITION OF BANDS

The position that plain bands should occupy on the teeth is an important one from the standpoint of esthetics and in the distribution of force and for the welfare of the tissues of the mouth that they do not interfere with the function of the teeth and that they may be well cared for during the time of treatment. As someone expressed it, in general terms bands should be adjusted occlusally so as not to interfere with mastication and gingivally so as not to impinge upon the gums. In fact, there is but one correct position for a band to occupy on each individual tooth, because only in this position can it afford the greatest firmness and stability of attachment. This position is transversely to the crown of the tooth, and the band should be so placed as to embrace equally the mesial and distal swells of the crown in an occlusal and gingival direction. The natural lateral swell of the crown of the tooth will prevent the sliding of the band either gingivally or occlusally, if it is accurately fitted and properly cemented. And this position should be strictly adhered to in the case of each tooth, regardless of its position or that of any other tooth except when incomplete eruption of the tooth makes the correct placing of the band temporarily impossible. The placing of bands on partially erupted teeth can be very accurately adjusted in many instances by making and fitting the band to the same tooth in the opposite side of the arch and as the gum tissue will tolerate passing the band for a considerable distance under the free margin provided care is taken to avoid any rough surfaces and that all excess cement is removed and any attachment made to the band be far enough occlusally not to interfere in any way with the soft tissues. The precision in which this can be done even in teeth that are impacted and necessitating surgical removal of the gum and process in order to expose the crown of the tooth is better procedure than to mutilate the tooth by drilling a small hole in the enamel and cementing a pin to carry a rubber or grass-line ligature. This brings out a very interesting side of treatments as they are viewed today compared to a few years ago in that the correction of irregularities is a progressive one rather than an immediate and definite one allowing Nature to do her best and inter-

fering as little as possible. We are truing up dentures for further development, watching the succession of unerupted teeth and interfering if necessary at a later date, grouping the treatment over a period of years rather than one or two. There is more uniformity in making and adjusting bands to the anterior teeth than there is in the case of molar anchor bands; while the technic in constructing molar bands is very similar, the pinch is generally made from the buccal instead of the lingual surfaces and in some instances, particularly in the mandibular molar bands, the seam is reversed to the lingual and labial surfaces and attachments made to the seamless portion of the bands. Some however prefer using wire measurements, but this has always been more or less uncertain in my hands, due to my inability to correctly measure the greatest circumference of the tooth as the wire is either misplaced or misapplied and then it consumes more time. It apparently seems that the mandibular molar bands are the most difficult to accurately adjust as they more frequently come loose, which may be due partially to the saliva which is more apt to become incorporated with the cement at the time the bands are set, but is due probably more to the anatomical shape of the crown which a review of the surfaces of the teeth will illustrate; for instance, the buccal surface is a modified rectangle with the greatest diameter mesio-distally, while the same surfaces in the mandibular first molars are irregular or trapezoidal in form, and the mesial and distal line angles converge towards the gingival with about equal degrees of convergence and equally convex. The lingual surface of the maxillary molars has the greatest diameter mesio-distally and is convex in all directions and tapering gingivally with the gingival border, being very nearly straight; while in the lower the mesio-distal diameter is not as great as the buccal surface of the same tooth, but having a convexity in all directions, the convexity being greatest in the occlusal third. The mesial and distal surfaces of both maxillary and mandibular molars is convex bucco-lingually and occluso-gingivally. The circumference of the maxillary molars being greatest in the occlusal third the convex surfaces taper gingivally to form a bell shape, and the relative straight gingival border of the lingual surface acts as a means of holding the band in place and preventing its displacement. In the mandibular first molars while the surfaces are convex occluso-gingivally the convergence is not so great as in the maxillary first molars and the gingival marginal ridge is convex with the convexity toward the root. The bands must also be made to conform to the mesial and distal surfaces of which surfaces are not only slightly convex bucco-lingually, but decidedly convergent occluso-gingivally in the occlusal third. The festooning of the bands is necessary in order to get a good adaptation to these surfaces, otherwise they act as a source for the collection of debris and eventually decay. The bands should be carried to the free margin of the gum on both the lingual and buccal surfaces and occlusally so as not to interfere with the function of the teeth and that no undue strain will be brought to bear on the bands in mastication. It is desirable that all bands, in fact the complete mechanism, be placed upon the teeth as soon as it is consistent with the physiology of the teeth and soft tissues of the mouth that development may continue uninterrupted throughout the

treatment. Where two or more bands are to be made and adjusted to the teeth it is my custom to make up and cement to place two bands at a time never attempting to cement three or more bands with one mix of cement. Where appliances are to be adjusted to the teeth in both maxillary and mandibular arches it is a very good policy to have a definite starting point and while this may be optional and vary to some extent with the conditions it tends to systematize the procedure and it is easy to keep a record and check on what you are doing for each patient.

ATTACHMENTS

Attachments made to bands should be as delicate as possible without sacrificing strength, and well located so that they will not interfere with the movements of the teeth and not move in cases where movement is not desired. Of the delicate detail to be carried out in making appliances, attachments are the most intricate and require considerable skill, particularly when making up and adjusting the pin and tube, ribbon arch and bracket bands and other forms with which I am not so familiar. When making practically rigid attachments from arch to bands and aligning the tubes on anchor bands, to conform in every respect to the irregular outline of the positions of the teeth, that they do not impinge at any point preventing the free distribution of force, is most difficult, but once obtained the results are most pleasing and very easily accomplished as compared to those forms of appliances where there is a great deal of lost motion in distributing this force. In this way our opportunities for self-improvement are greatest and we will be able to confer the greatest amount of good on our patients. Compensatory treatments for missing teeth always complicate our mechanism which means additions to the appliance that may otherwise be simple and compact. The sensibilities of some of our more refined folks are very averse to wearing anything that is unnecessary and where the conditions will warrant it all attachments such as spurs, lingual bars, ligatures, tubes, loops, excess cement, and even an oversupply or extra lengths of necessary material should be dispensed with as much as possible. Arranging the attachments to the arch or to the bands must be in harmony with the direction in which the tooth is to be moved and the treatment preceded by a diagnosis that is always carried definitely in mind. No matter what the position of the teeth may be as a whole, individual teeth must be considered from the standpoint of technic and what the tooth is to carry in the way of a band and attachment.

THE ARCH

The labial alignment wire has gone through evolutionary stages from the large sixteen-gauge arch to one of exceptionally small gauge and from the round to the half round, square, and flat, with the result of considerable improvement in the ones that are now being used. The lingual alignment wire, as it is now perfected, with its removable attachment, affords much relief in many hands where bodily movement of the teeth is not required. Some are using both the lingual and labial wires in combination, securing the expansion of the dental arches with the lingual and the root movement or control of the anterior teeth with the labial wire. This appears to me as being unnecessary unless it be in

a stubborn case of expansion where it requires more force than can be gained by the labial alignment wire through its lateral spring and auxiliary attachments. The neatness and simplicity with which the lingual arch has been perfected by Drs. Lourie and Mershon makes it very desirable to use in many mouths. The locking device of the removable lingual arch of this type is more or less unstable with considerable lost motion, especially where no provision is made for holding the anterior portion of the arch in position. Of the number of locks advocated, all, as far as I am able to analyze their construction and adjustment, seem to have apparently the same disadvantage; however, neatly adjusted bands with lingual spurs to some of the anterior teeth tend to obviate this disadvantage and would not in any way interfere with the arch being removed and replaced in making adjustments and adding any necessary attachments. This may appear more of a discussion of appliances than one of technic, but as the requirements of treatment of individual cases call for the selection of a definite appliance for a specific purpose that various changes may be brought about simultaneously, and in the minimum time consistent with bone development, and as the selection of the appliance must precede technic, it is only consistent with good workmanship, that the arch be well considered as to its possibilities. In perfecting our skill and understanding of the construction, application and operation of any appliance with the view of getting good results, is not accomplished in a few months, or in a few years, as testing out the possibilities of any mechanism is not so very favorable, and it is better for one, especially a young orthodontist, to follow the principles and technic of a man who is older in experience, and with a well systematized procedure. There are only a few men who have the ability to go out into practice, after receiving a limited amount of instruction in technic, and cope with the situation, without a great deal of experimenting, and with indifferent results. Unless our technic is so perfected that we may not only preserve, but conserve the health of the teeth during the treatment, but little will have been gained by our interference. Technic always inspires confidence on the part of the operator and where there is a successful starting we generally always find a satisfactory ending.

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DISCUSSION

Dr. Harry L. Hosmer, Detroit, Mich.—In discussing a paper on good technic it might be well to take into consideration a permanent record of the models. It seems to me a man who undertakes the treatment of a case of malocclusion should, first of all, be sufficiently interested in that case to make a permanent record that can be referred to and embrace the methods that are used in the treatment. This should not only be done by the younger men but by the older men in the profession, and I believe it should be fol-

lowed by every good orthodontist, so that we may refer to these records from time to time in checking up our work and making sure our appliances are doing the particular thing for which they were constructed.

In regard to bands I most heartily agree with our essayist that we should be careful about the fit of a band at the occlusal portion of the tooth, because where trauma is present from the occlusion of the maxillary teeth against the mandibular or *vice versa*, the cement becomes disintegrated and the band will soon loosen. So in festooning the crown it should also be festooned on the occlusal surface as well as on the gingival. Regardless of how well a band may fit on the tooth, or how well it may be adapted, if it interferes in mastication, by the opposing tooth striking the band, it will loosen. I think probably the greatest difficulty I had when I took up orthodontia was in keeping bands on, and I have no doubt that is the experience of a great many men. Even now I find they come off with disgusting regularity.

It might be advisable at this time to take up the ingredients of band material. Personally, I have much preferred precious metal and have used with greatest satisfaction platinum and gold material. However, I have also used iridium and platinum, and there are several instances in my experience in using this material in which I have found that the band has fractured at the junction of the solder and the band; that is, where I have soldered an attachment to a band I have seen a clean fracture. Whether that was due to the improper application of heat or faulty alloying of the metal I do not know. In every instance of the use of iridium and platinum band material this has occurred. There is no question but that a precious metal band has great strength and durability, and enables a person to make it fit the tooth nicely, which is very gratifying.

I must disagree with the essayist when he says that none of the precious metals will irritate the tissues. I do not believe any precious metal band can be constructed so that no irritation of the tissues will follow.

Too much cannot be said as to the importance of a good technic in band construction. There are a great many dangers involved in bands that do not fit teeth. In the manner of construction of bands I think it is up to the individual and his skill. Some men can make bands by the direct method, but in the majority of instances, especially among the younger men, the indirect method of band making gives better results because the young practitioner has more time for the procedure, and there is much less discomfort and inconvenience so far as the patient is concerned.

Dr. Duckworth spoke about making and fitting a band over a tooth that was impacted or partially erupted, namely, on the opposite tooth. I can readily see why he could get a certain circumference of the tooth by measurement, by making it on the opposite tooth, but I do not see how he could make a band fit a tooth that is partially erupted if he fitted it on the opposite side. It is possible that I may have misinterpreted what he tried to bring out.

In regard to appliances being free from unnecessary attachments, I readily agree with him, and not only because of the sensibilities of the patient but for hygienic reasons, to say nothing of the saving of labor and materials.

Locking devices are the same as bands. Dr. Duckworth said he felt that most locking devices were unstable. I believe that a locking device that is sufficiently stable to get physiologic development is useful. In other words, if an attempt is not made to move the teeth too rapidly, these locking devices are sufficiently stable to carry on the treatment.

In regard to appliances being free from unnecessary attachments, I readily agree with a very high polish. When they are completed they are polished and refitted on the model. Before they are removed, be sure they have not been distorted in the polishing. When the patient comes back for adjustment, the appliances are taken off and dropped into a solution of potassium cyanide and they go back to their original polish. I like to work with appliances that are clean looking and highly polished. I like to drop the appliances into a solution of potassium cyanide, if you bathe them in ammonia it counteracts the potassium cyanide. This brings out the original polish you put on your appliances.

Appliances should be constructed with the idea of simplicity and keeping in mind at all times that the biggest handicap we have is an appliance that does not properly fit.

I want to congratulate Dr. Duckworth on his paper. It was very fine.

Dr. J. W. Ford, Chicago.—I want to compliment Dr. Duckworth on his paper for calling our attention to some things we sometimes overlook in our enthusiasm for appliances and methods of treatment. He states that he has perfected his technic on account of indifference. I think we can all agree with him in that.

When we were in dental college and heard so much about technic we thought that as soon as we graduated we would perfect our own technic. It was soon discovered that we were not able to vary from the technic taught us to the extent that we at first thought possible. The same applies to technic in orthodontia.

Many important points were brought out relative to the construction of bands. I was pleased to hear that the essayist favors precious metals and lap joints. Personally, I have had little trouble in fitting bands at the gingival margin but it took me some time to learn that it was also necessary to festoon most bands at the occlusal margin so as not to interfere with the occlusion of opposing teeth. I am glad this point was mentioned as it is very important.

The essayist mentioned the loss of motion in the adjustment of appliances which is very important. Care must be taken in attaching spurs to anterior teeth for finger springs, to stabilize an appliance, as this may sometimes result in the movement of the teeth used.

The whole question of technic I think can be summed up in the fact that one must follow individual technic to perfect his own work. One man may know more technic and need it to accomplish what another may do with a seemingly shorter technic.

Dr. Asa J. La Grow, Oak Park, Ill.—There is one point we all know about, namely, the adjustment of finger springs which are applied for the purpose of moving teeth which are not, usually, banded. We all know that we can either depress or elongate a tooth with a finger spring. Sometimes I have elongated a tooth when I did not intend to do so because the finger spring rested on the wrong inclined plane of the tooth. On the other hand, we can take advantage of the surfaces of teeth, by placing our springs advantageously. That has a direct and important bearing on the adjustment of finger springs.

Dr. Joseph D. Eby, New York City.—Dr. Hosmer has mentioned something about the use of cyanide of potassium for cleansing appliances. Because of the fact that most men are aware of its most deadly poisonous properties, it is not generally used, but for many years I have used a strong solution for the cleansing of such appliances as the Jackson Appliance, which erodes very easily and becomes filled with numerous pits and crevasses, without the slightest danger. My plan was to use a one-half pint air-tight self-sealing jar with a clamp top into which a few crystals of cyanide of potassium would be dissolved in water. This jar was kept in a very safe place and labeled conspicuously "poison." Owing to the fact that cyanide has such an extreme affinity for water, it was perfectly safe for an appliance to remain in the solution for a few minutes and after removal to be held and scrubbed thoroughly under a stream of running water where every vestige of cyanide would disappear, and the appliance would be cleaner than would ever be possible to attain by all other methods.

While studying zoology as a boy I once administered one-half a teaspoonful of a 50 per cent solution of cyanide of potassium to a grown cat, which caused death instantaneously, and with that fact clearly in mind and with the use of cyanide solution for many years under the conditions explained above, I can assure you that it is very safe and efficacious, but not to be in any way abused and I do not believe its regular use is indicated for appliances made of noble metals.

Dr. William C. Fisher, New York City.—I would like to ask whether this solution can be brought to a boiling point without affecting the temper of the appliance.

Dr. Duckworth (closing).—Dr. Hosmer brought up the point of banding the teeth in the opposite side of the mouth, to get the band adapted to the unerupted tooth. That is only possible in a few instances, but occasionally you will find maxillary canines that are

not fully erupted. One of them may be considerably in advance of the other in eruption and on which a band can be made and adjusted very nicely without irritating the gums, while in the one on the opposite side it would be most difficult to make such adjustment and by making two bands for the tooth that is sufficiently erupted one of the bands will fit the tooth not so far advanced.

In the cleansing of the appliances I use alum water. I take cold alum water and bring it gradually not to the boiling point, but until it gets hot, and it seems to clean up my appliances better than anything I have ever used.

FIRST UPPER PERMANENT MOLARS PARTIALLY IMPACTED AGAINST SECOND DECIDUOUS MOLARS*

By Harold Chapman, D.D.S., L.D.S., London, England

THE four cases which I am about to show present an irregularity which is not unknown, but nevertheless has received little mention in the literature. At the meeting of the American Society of Orthodontists last year, Dr. Grafton Munroe showed a case of this type.

The particular irregularity concerns one tooth only—the first permanent maxillary molar (Figs. 14, 15 and 16) which, instead of erupting into cor-

Fig. 1.

Fig. 2.

rect vertical relation with the second maxillary deciduous molar of the same side, has its occlusomedial angle caught in the depression, i.e., the neck, on the distal surface of the second deciduous molar. This results in an impaction of the permanent molar, but only a partial impaction, for the occlusodistal corner erupts into occlusion; the inevitable result is a tipping medially

*Read before the Alumni Society of the Dewey School of Orthodontia, Chicago, Ill., April 27-28, 1922.

of the crown of the permanent tooth, as well as a forward translation of the tooth as a whole.

While the irregularity indicated by the title of the paper concerns one tooth only *a priori,* I do not think it would be correct to imagine it to be an error existing, or which may exist, without other orthodontic abnormalities; I would rather incline to the view that it is only one expression of a subnormal development, or of a development which is imperfectly correlated in its various stages. It is, therefore, interesting to speculate as to the cause

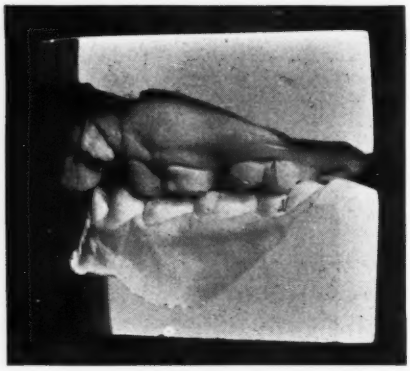


Fig. 3.

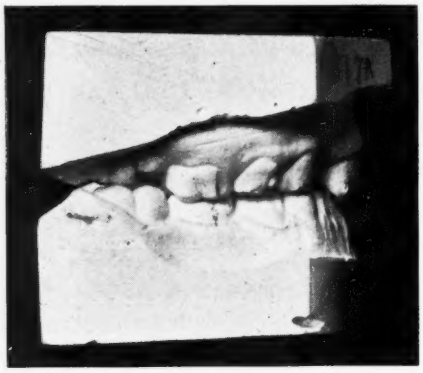


Fig. 4.

Fig. 5.

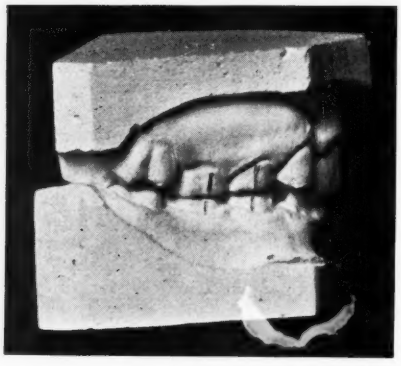


Fig. 6.

of this condition; to me it is an unusual expression of small arches which, in three of the cases I show, are very small. As you are aware, the permanent maxillary molars erupt, not vertically, but by a rotary movement with the apices of the roots as a center, this movement being forward and downward as regards the crown of the tooth.

For the condition illustrated to occur, it would seem that the forward movement of the crown of the first permanent maxillary molar must be in excess of the downward movement, as regards their normal amounts. This results in the medial surface of the crown coming in contact with the de-

ciduous molar, while it is still unerupted and then, as the downward movement occurs, the occlusomedial angle is trapped at the neck of the deciduous tooth. With regard to the distal surface of this upper permanent molar, it is proximal to the medial surface of the unerupted second permanent molar, so there seems little probability of impaction on that side. As in anchorage there are always the two factors, action and reaction, so in cases of the

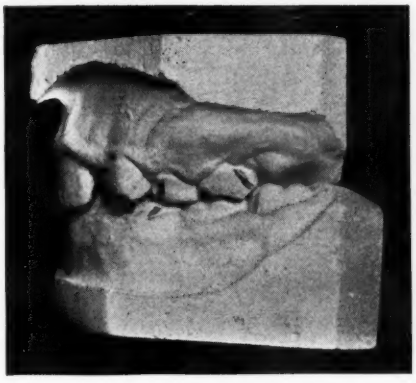


Fig. 7.

Fig. 7-A.

Fig. 8.

Fig. 8-A.

nature of those under consideration there are always at least two possible causes. Therefore, we must not overlook the possibility of these impactions being due to a lack of forward movement of all the deciduous teeth and bone containing them, as well as to the possibility of the permanent molar having moved forward too much prematurely; if the former occurred a space sufficiently large to enable the permanent molar to erupt correctly, might not have developed.

Again, one can imagine the possibility of a combination of these causes and, added to them might be early eruption of the permanent molar.

TREATMENT

In the treatment of these cases it is important to remember that the crown of the permanent molar is further forward than normal in relation to the deciduous teeth. If the second deciduous molar is extracted and no

Fig. 9.

Fig. 10.

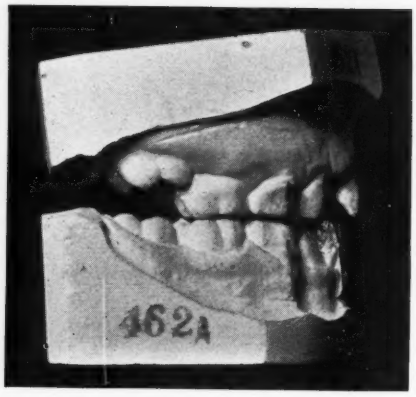


Fig. 11.

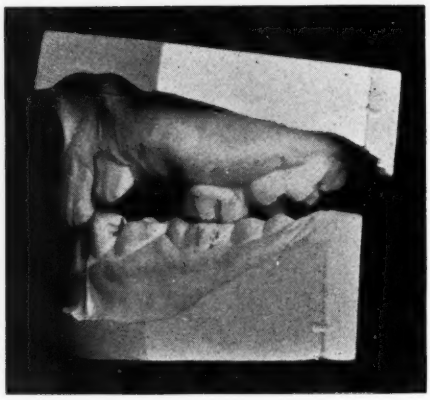


Fig. 12.

further treatment adopted, the permanent molar becomes vertical in time, but in a relatively medial position. In order that the anterior teeth shall be correctly placed, it will be necessary either to remove a tooth in front of the molar, e.g., the first or second premolar, or to move the permanent tooth posteriorly into its correct relation into the mandibular teeth. Such movement would be by inclination and translation.

The first two of the four cases I have to show, have been treated by extraction of the first premolars; the maxillary ones only in one case and the

maxillary and mandibular in the other; in both the arches are very small. One patient lived two hundred miles from London and the other is at present in Egypt and has teeth of poor quality; two mandibular premolars are congenitally absent in this case. In the third case my advice was sought after some expansion had been accomplished. In consultation with the family dentist it was decided to extract ultimately the four first premolars and at present to correct the positions of the incisors, the maxillary ones having

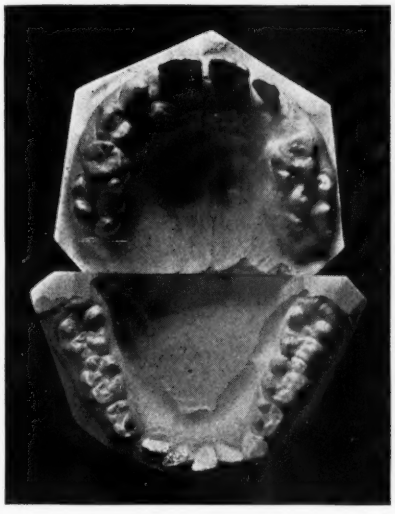


Fig. 13.

Fig. 16.

Fig. 14.

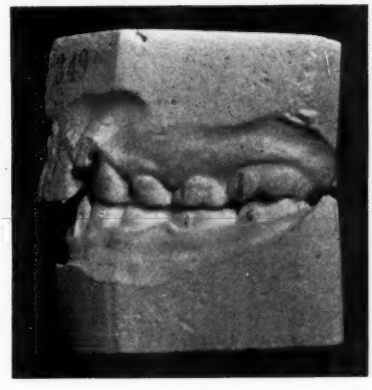


Fig. 15.

moved to the left and the mandibular ones in the opposite direction. The parents of this boy live in India.

In the fourth case the patient was ideal. She happens to be one of the first in whom I used gold inlays for anchorage, and as one of the deciduous molars in which these were placed has since come out I take the opportunity to show it to you. I regard these as an admirable method of anchorage. In this case the smallness of the arches was less severe and conditions were favorable, so it has been treated in the orthodox manner by retaining all the teeth.

Case No. 317.—Model 317, age six years, nine months, October 21, 1919. (Figs. 1 and 2.) Model 317A, age eight years, four months, June 27, 1921. (Figs. 3, 4, 5.) *Class I*: Arches very small; teeth of poor quality. 6/6 have not yet made their appearance. (Figs. 1 and 2.) A mandibular premolar is absent on each side. On May 28, 1920, I replied "Yes" to a dentist who

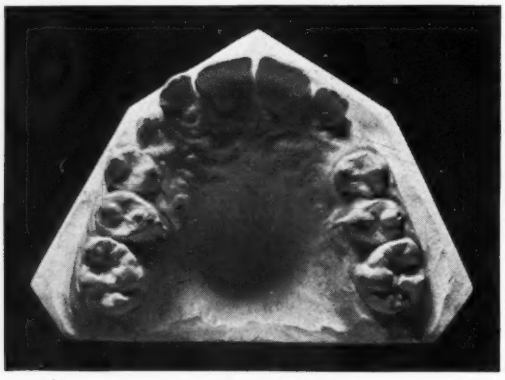
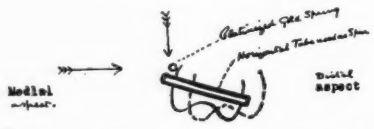


Fig. 17.

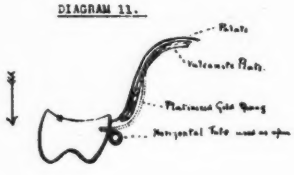
inquired if he should extract /e as /6 is impacted against it and causing its absorption. I have made no models of this condition. Fig. 3 shows the position of /6 thirteen months later; it is practically vertical and has come forward so much that it obliterates the space previously occupied by /e.

DIAGRAM I.



Lingual surface of the molar on which is a band (not shown) carrying an horizontal tube to be used as a spur which the spring, shown in cross section, will engage. The position which the tooth is to occupy is shown by the broken line. The arrows show the direction of force.

DIAGRAM II.



Coronal section through medial aspect of molar and palate; the horizontal tube (but not the band to which it is attached) is shown in cross section. The vulcanite plate, with the spring it carries, is shown in situ. The arrow shows the direction of force.

On June 27, 1921, 6/ is impacted in the same way (Figs. 4 and 5). July 1, $\frac{c/c}{c/c}$ were extracted. Later perhaps $\frac{d/d}{d/d}$ will be extracted and ultimately 4/4 will be removed, October 28, e/ extracted.

Case No. 338.—Model No. 338A. Aged eight years, eleven months. March 24, 1920 (Figs. 6, 7, 7A). Model 338B. Age ten years, six months. October

11, 1921 (Figs. 8, 8A and 9). *Class II.*—Division 1. $\overline{6/}$ is posterior to normal; $\overline{/6}$ is normal or slightly medial; arches very small; $\underline{/6}$ is impacted.

The following were extracted: $\frac{dc/cde}{d/d}$

The result is shown in Figs. 8 and 9. There was no impaction of $\underline{6/}$.

Case No. 462.—Model 462, lower only, age (about) six years, eight months. February, 1920. (Fig 10.) Model 462A, age eight years, five months, November 23, 1921. (Figs. 11, 12 and 13.) *Class II*: Division II; right side posterior; left side normal; $\underline{6/}$ is impacted. Case under treatment when a consultation was requested; some expansion had been obtained. This treatment has been abandoned; $\underline{e/}$ has been extracted; also $\underline{c/}$ and $\overline{/c}$ to give the incisors an opportunity to straighten themselves; if this does not occur appliances will be used to bring this about. Ultimately the four first premolars will be extracted.

Case No. 349.—Treated by retaining all teeth. Models 349. Age seven years, ten months. June 15, 1920 (Figs. 14, 15, 16). *Class II*: Treatment started July 6, 1920 with an upper Badcock plate. During October 1920, $\underline{e/}$ was lost naturally; until then it had been used to retain the plate; it was the first of $\frac{edc/cde}{edc/cde}$ to be shed. Then $\underline{6/}$ and $\underline{d/}$ were used to retain the plate; the clasp for $\underline{6/}$ also being employed as a spring to move the tooth distally; this was not very successful. On February 23, 1921, an upper lingual arch was put in for this purpose, pressure being obtained by opening a loop. May 20, 1921, the fixed appliance was discarded (except for the band on $\overline{6/}$) and replaced by a plate to open the bite and having a spring to elongate the medial aspect of $\underline{6/}$ and to push this tooth distally (Diagrams I and II); in both, the spring is indicated by a dotted line which should not be confused with the direction line of the explanatory wording. This was completed by September 27, 1921. A fixed upper appliance was again used with buccal and lingual arches not only for retention, but also for expansion of $\overline{6/6}$ and alignment of $\underline{654/}$. The models (Fig. 17) taken July 18, 1922, show $\overline{5/}$ almost in position, but since that date the alignment of $\underline{654/}$ has been entirely corrected by an auxiliary spring, attached to the lingual arch, acting on the second premolar.

REVIEW OF THE DEVELOPMENT OF THE PITUITARY AND PINEAL ORGANS

By Martin Dewey, D.D.S., M.D., New York City

DURING the last few years the relation of the ductless glands to certain abnormal developments of the teeth and supporting structures has received considerable attention. In fact the physiology of the ductless glands has long received attention from the medical profession and during the past few years experimental surgery has done much to solve the rôle these glands play. The clinical study of cases in which the action of certain glands has been known to be abnormal, has also given much light.

There seems to be a relation existing between the entire group which

Fig. 1.

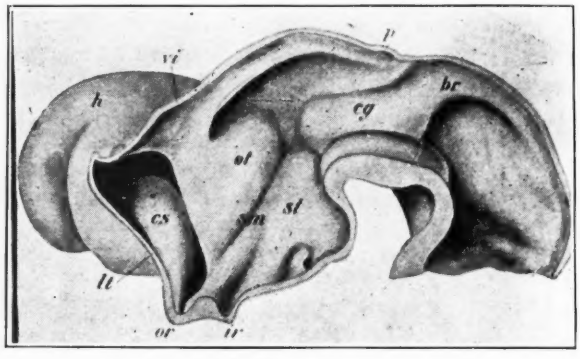


Fig. 2.

Fig. 1.—Dorsal view of the brain. (His.) From The Development of the Human Body. (McMurrich.) (*b*) Superior brachium; *cg*, lateral geniculate body; *cp*, chorioid plexus; *cqa*, anterior corpus quadrigeminum; *h*, hippocampus; *hf*, hippocampal fissure; *ot*, thalamus; *p*, pineal body; *rp*, roof plate.

Fig. 2.—Median longitudinal section of the brain. (His.) From The Development of the Human Body. (McMurrich.) *or*, Optic recess; *ot*, thalamus; *ir*, infundibular recess; *p*, pineal process.

includes the pituitary and pineal which are located in the cranial cavity. As we pass "down" the body we come to the thyroid, parathyroid, mammary and the thymus. The adrenals also seem to play a particular rôle and undoubtedly the sexual glands can be classed among the endocrine group. However important all these glands may be, it is my purpose at this time to consider briefly the development of only two of them: the pineal and the pituitary, and review to a certain extent some of the literature relative to the development of these structures.

Clinical investigators have been very busy trying to solve the physiology and pathology of the pituitary and pineal, and very little has been written

in regard to their development. In fact, in going over the literature dealing with the anatomy and development of these two structures, I must confess I found very little. The development of these two organs, to a certain extent, is interesting: whether it throws any light on the physiology and pathology is another question.

The pineal gland develops from the upper border of the midbrain and makes its appearance very early in life. Fig. 1 "A transverse section through the diencephalon of the embryo at about five weeks shows a differentiation of brain into the roof plate, the floor plate and the tissue forming the lateral walls. At the posterior end of the ridge which represents the roof plate (RP) we find a divided elevation which elongates until it reaches the dermis forming a hollow invagination of the brain roof known as the pineal process. The distal extremity of the process enlarges into a sack-like structure which later becomes lobed and by an active proliferation of cells finally becomes a solid

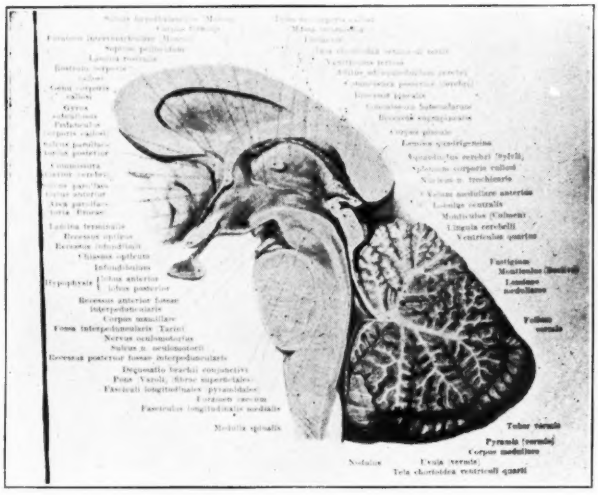


Fig. 3.—Median section through the brain stem showing the hypophysis and pineal gland. From Hand Atlas of Human Anatomy; Spalteholz.

structure known as the pineal body. The more proximal portion remains hollow, forms the pineal stalk which with the body is known as the epiphysis."

From the above statements it will be seen that the pineal gland as it is known in endocrinology, has an early development. This development is also interesting from an evolutionary process. Anatomists and embryologists have been in doubt as regards the significance of the pineal organ in man and I do not believe there is much proof even among the endocrinologists as to the real importance of this so-called "gland." In the reptile and other lower forms the outgrowth is double, a secondary outgrowth arises from anterior portion of the primary one. The anterior invagination elongates until it reaches the dorsal epidermis of the head, then expands and develops into an unpaired eye, the epidermis which overlies it becomes converted into a transparent cornea. In mammalia only the posterior process develops and the question arises in regard to the function of this posterior lobe when developed by itself. The pineal body is free from nervous constituents. It is dark

red in color, consists of a number of follicles which are lined with epithelial cells. Does the pineal body as developed in man have any relation to the pineal eye as found in lower animals? Is the pineal body a real gland or only a rudimentary structure left as a result of a functional organ in lower animals?

The pituitary body has two points of development and may be considered

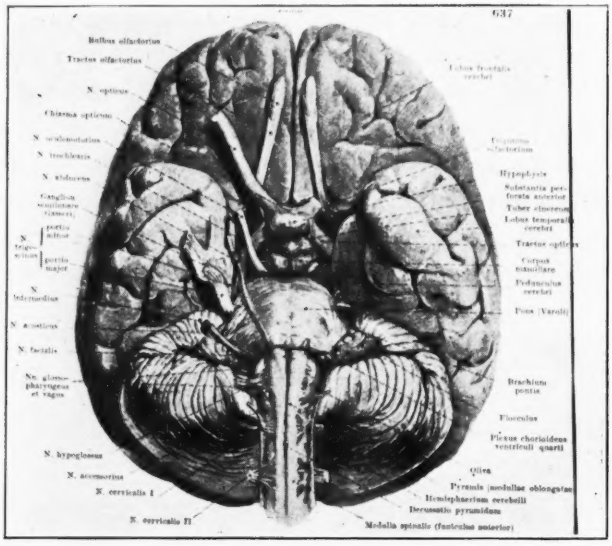


Fig. 4.—Brain viewed from below and in front showing hypophysis in relation to surrounding structures. From Hand Atlas of Human Anatomy; Spalteholz.

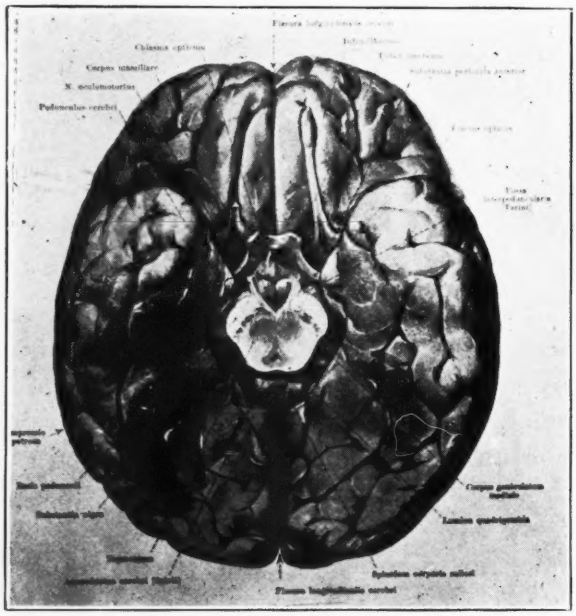


Fig. 5.—Base of cerebrum, showing the infundibulum, the pituitary has been removed. From Hand Atlas of Human Anatomy by Spalteholz.

as having a double origin which may account for the two-fold function. About the time the pineal body is developing on the roof plate of the brain we find an evagination from the floor plate known as the infundibular recess (Fig. 2, IR) which elongates into a process known as the hypophysis. The

extremity of the hypophysis comes in contact with the Rathke's pouch which is formed from an invagination of the epithelial lining of the stomodeum.

The posterior position of Rathke's pouch applies itself to the hypophysis to form the anterior lobe of the pituitary body. As Rathke's pouch projects backward from the stomodeum through the connective tissue structure which later forms the chondrocranium to reach the hypophysis, we find the an-

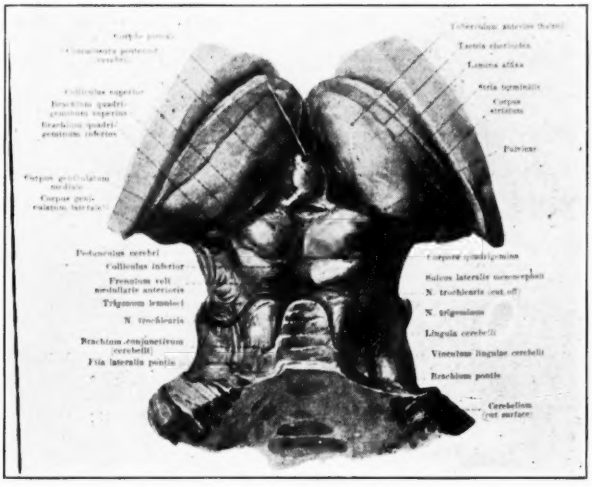


Fig. 6.—Corpora Quadrigemina, viewed from behind and open, showing pineal gland. From Hand Atlas of Human Anatomy; Spalteholz.

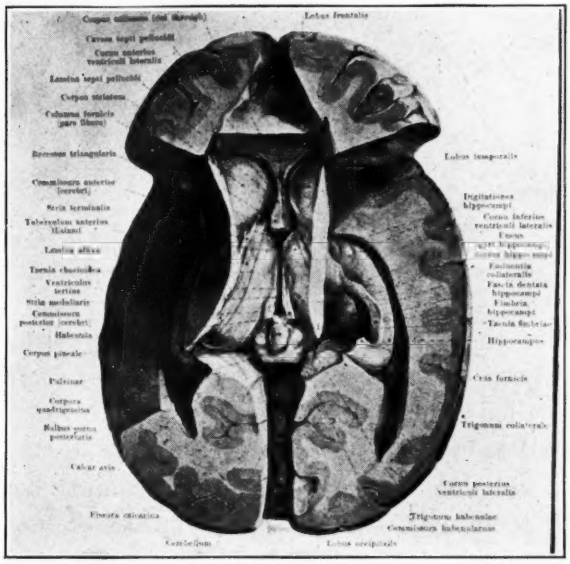


Fig. 7.—Third Ventricle opened, viewed from above showing pineal gland. From Hand Atlas of Human Anatomy by Spalteholz.

terior portion of the canal is converted into the craniopharyngeal canal. The craniopharyngeal canal disappears with the calcification of the chondrocranium and its location in life is represented by the sphenoidal sinus. The anterior lobe of the pituitary body, as it lies in the sella turcica represents the posterior end of Rathke's pouch or the posterior end of the craniopharyn-

geal canal. At the anterior end of the craniopharyngeal canal, we find a mass of lymphoid tissue known as the pharyngeal tonsil. Some men claim that the maldevelopment that is associated with adenoids is due to the influence of the lymphoid tissue on the pituitary body through small openings that allow for communication through the sphenoidal sinus.

It will be seen in Fig. 3 that the pineal gland and the pituitary are located on opposite sides of the brain. If there were any interchange of secretions between these two glands, such interchange would have to pass through the entire body of the brain or pass through a more collateral circulation than would probably be possible.

Fig. 4. The brain, when viewed from below and in front, shows the pituitary body. This organ lies in the sella turcica and in removing the brain great care must be exercised or the pituitary will remain in the skull.

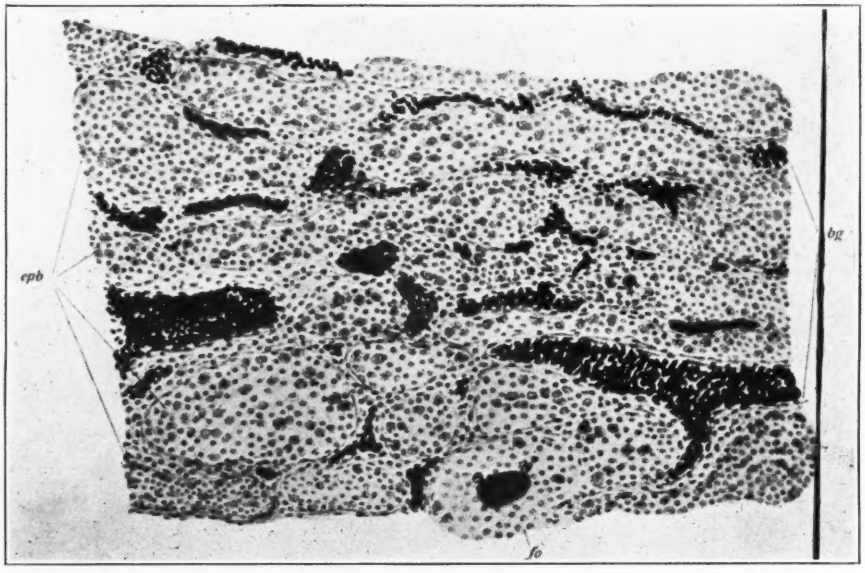


Fig. 8.—Histological Section of the Pituitary from Text Book of Histology by Krause, Schamhal.

Fig. 5 is another view of the base of the brain, from below in which the pituitary body has been removed and the base of the infundibulum is shown. We have already called attention to the fact that the pineal body and the pituitary gland are located practically on opposite sides of the brain.

Fig. 6 shows a view of the brain from behind and above and the pineal body can be clearly seen as it is pulled up by means of the tenaculum.

In Fig. 7, we have the third ventricle opened and the pineal viewed from above and the pineal gland is again shown as a comparatively small structure lying between the right and left halves of the brain. It is the small size of this organ in the adult mammal as compared with the size in the reptile which leads us to believe that it may be an evolutionary structure with little function in the endocrine group.

In reviewing a number of modern histologists, I found but little from a histological standpoint on the pineal gland. The pituitary was treated a

little more completely. Importance was given to the fact that the anterior lobe was rich in blood vessels and made up of a large number of cells, polyhedral in shape and arranged in columns of one, two, three and sometimes six, which cells seem to be the active part of the organ. In the anterior lobe are found some epithelial cells and a few follicles lined with epithelium, but a large number of follicles which are filled with colloid material very similar to the appearance of the colloid material in the thyroids. This similarity of structures, as well as the arrangement of cells and epithelial crypts would lend weight to the fact that the pituitary was one of the endocrine group. Also clinical disturbances occurring as a result of disturbances in the development of the pituitary would lend weight to the fact that it was an important structure. There are no nervous elements in either lobe. (Fig. 8).

So far as the pineal gland is concerned, I was unable to find in the literature any definite or positive proof that the pineal gland played any rôle whatsoever in the normal and abnormal development. From an evolutionary standpoint, I wonder whether too great stress has not been placed upon the pineal organ because of its anatomical appearance and not because of the clinical symptoms.

CASE REPORTS

CONSTITUTIONAL DISTURBANCES, DIET, AND ENVIRONMENT AS RELATED TO ORTHODONTIC TREATMENT; CASE REPORTS*

By R. C. Willett, D.M.D., Peoria, Ill.

THE cases to be reported here are those in which constitutional disturbances were diagnosed as being of such a character as to interfere with orthodontic treatment. In the treatment of these cases it seemed imperative that the general physical and mental conditions should be brought under control if satisfactory results were to be expected. At the time these cases were entered for examination, prior to the beginning of treatment, such a thing as presenting the case history and treatment in the form of a report was not thought of, hence the lack of much recorded data, relating to these cases, that would prove interesting at this time. No claim is made for originality in the management of the cases, nor is the treatment described to be considered authoritative. They are simply given to show what was done in my own practice, where matters of constitutional disturbance, diet, and environment were taken into consideration in connection with orthodontic treatment.

Case No. 1. N. S. Date of entering case record, June 12, 1917. Sex, female; age, eleven years, five months; height, 56 inches; weight, 73 pounds, 6 ounces. Photograph taken in office shows front view of the face. Radiographic examination: film showing mandibular left second premolar impacted. Home conditions: farm, modern in every respect, sanitary. Respiration: partial mouth-breathing. Operation for removal of adenoids and tonsils, September, 1916. Heredity: paternal. Classification of oral and facial deformity was bilateral distoclusion; mandibular incisors encroaching upon soft tissues lingual to the maxillary incisors. Pernicious habits: Early life, thumb-sucking; at present time, biting of lower lip and biting of finger nails.

Advice was given to consult with the family physician relative to physical condition, which did not at that time seem to warrant the beginning of orthodontic treatment.

June 27, 1917, the patient returned for preparation to be made to begin orthodontic treatment. The family physician had disregarded my request for a general physical examination, or for one to be made at his direction, and for a report to be made of the findings of such examination. The responsibility of a general physical examination was then assumed through my own office, and entered in the case record as follows:

*Read before the American Society of Orthodontists, Chicago, Ill., April 24, 25, 26, 1922.

General observations: nutrition of skin and muscles good; size normal; weight 73 pounds, 6 ounces; height 56 inches, the same as that recorded fifteen days previous; attitude fair; buccal mucous membrane scarred, the result of long-standing stomatitis (cankers). Lymph nodules: superficial cervical show some enlargement, although small and dense; taken to be the result of tonsillar infection and deficient respiratory aeration. (History of tonsil and adenoid operation year previous to this examination.)

Chest: expansion 1½ inches; respiratory movements retarded; symmetry of chest good; mobility normal, but restricted in expansion; palpation negative for both heart and lungs; percussion, elasticity and resistance of chest good. Auscultation: heart more rapid than normal (irritable); closure of all valves accentuated; no enlargement; lungs negative except in both infraclavicular fossæ; the breathing sounds were rough, but no râles present.

Blood: examination of fresh specimen; hemoglobin 70 per cent; red cell count estimated 4,600,000; white cell count, 7,800; atypical cells, none.

July 7, 1917, urinalysis: specific gravity 1018; albumin none; sugar none; color straw; reaction acid.

This concluded the general physical examination of the patient. The patient was next seen the following month, August 9. The child had been away from home during the month and living under conditions of climate, diet, etc., that were unfavorable to one of her low physical resistance. While the color test of the blood showed an improvement of 15 points, being 85 per cent instead of 70 per cent as recorded on June 27, there had been a loss in weight of 5 pounds, 14 ounces. This loss in weight was regarded as a result of the extreme heat of the season, a change of water and other conditions from those of usual home life. Between August 9 and November 10, the child was seen at intervals of a few weeks. Aside from a slight gain in weight, there was no improvement in her general condition. On November 10, the mother reported that the child was constantly biting her finger nails and showed extreme nervousness when sitting. She was given to worry about the behavior of other children in school. An examination of the thyroid gland revealed an enlargement of the right lobe. There was some tremor and tachycardia present with loss of appetite, or if not lost, very uncertain.

Diagnosis: a type of hyperthyroidism due to the approach of adolescence. Treatment: restriction from gymnasium work in school. Instructed to lie down and relax each evening from fifteen to thirty minutes before eating dinner. In diet the patient was instructed to eat plenty of fruit and vegetables; the latter she was encouraged to eat in good quantities. She was requested to retire early and sleep until ready to arise or until time for school. In addition the following tonic was prescribed:

Trioxide of arsenic	gr. 2/3
Strychnine sulphate	gr. 2/3
Reduced iron	gr. 15
Quinine sulphate	gr. 30

M. et. fac. capsules No. 20. Sig. one to be taken 3 times a day.

December 15. Cheeks have filled out and the mother says that the thyroid gland began to disappear about two weeks following the visit of November 10, and adhering to instructions given at that time. The nervousness has almost entirely disappeared except that the patient still bites her nails. The patient eats, sleeps, and says she feels well. Some pains have been felt in the gastrocnemius muscles and a few times after retiring, but questioning revealed the fact that she had been out in the cold for a long time, and had been running rather strenuously. (All traces of thyroid enlargement gone.)

Treatment continued as follows: discontinued the tonic. Continued the diet as before. Suggested the wearing of leggings and to always dress warm when out of doors. To be given a hot tub bath frequently, using ¼ pound of magnesium sulphate to each bath, to be repeated as often as necessary for pain. At this time the orthodontic treatment was being well tolerated, with no seeming inconvenience to the patient.

Fig. 1.—Case 1. N. S.

January 4, 1918, the thyroid gland was small and could be palpated as that of one not much above normal size. The tremor had disappeared and the nervousness, so marked before, now showed a decided improvement. The patient weighed 78½ pounds—a gain of 11 pounds since August 9, 1917. Height 58½ inches—a gain of 2½ inches.

Blood examination: hemoglobin 88 per cent; red cell count 4,744,000; leukocyte count, 6,800.

Treatment: continued rest before meals; retire early; advised to sleep late in morning. Only limited gymnasium work in school to be allowed for the present. Outside exercise was strongly urged for the patient, and she was not to be allowed to practice her music for long periods. Add plenty of fruit to diet and magnesium sulphate added to the bath as before directed. The prescription containing trioxide of arsenic, strychnine sulphate, reduced iron, and quinine sulphate was again prescribed and taken as before—one capsule three times a day.

February 1, 1918; patient shows a healthy look in the face (as shown

in Fig. 1 and has gained during the month 1½ pounds, now weighing 80 pounds. She also shows a gain of ¼ inch in height since January 4. All traces of thyroid enlargement have disappeared. The patient has the moderate adenitis that was present when the treatment began. No tremor can be found, and the patient eats, sleeps, and feels good. The termination of the orthodontic treatment was quite satisfactory.

Case No. 2. V. L. Case entered for examination July 10, 1918. Sex, female; age, 13 years, 1 month; height, 58¾ inches; weight, 77¾ pounds.

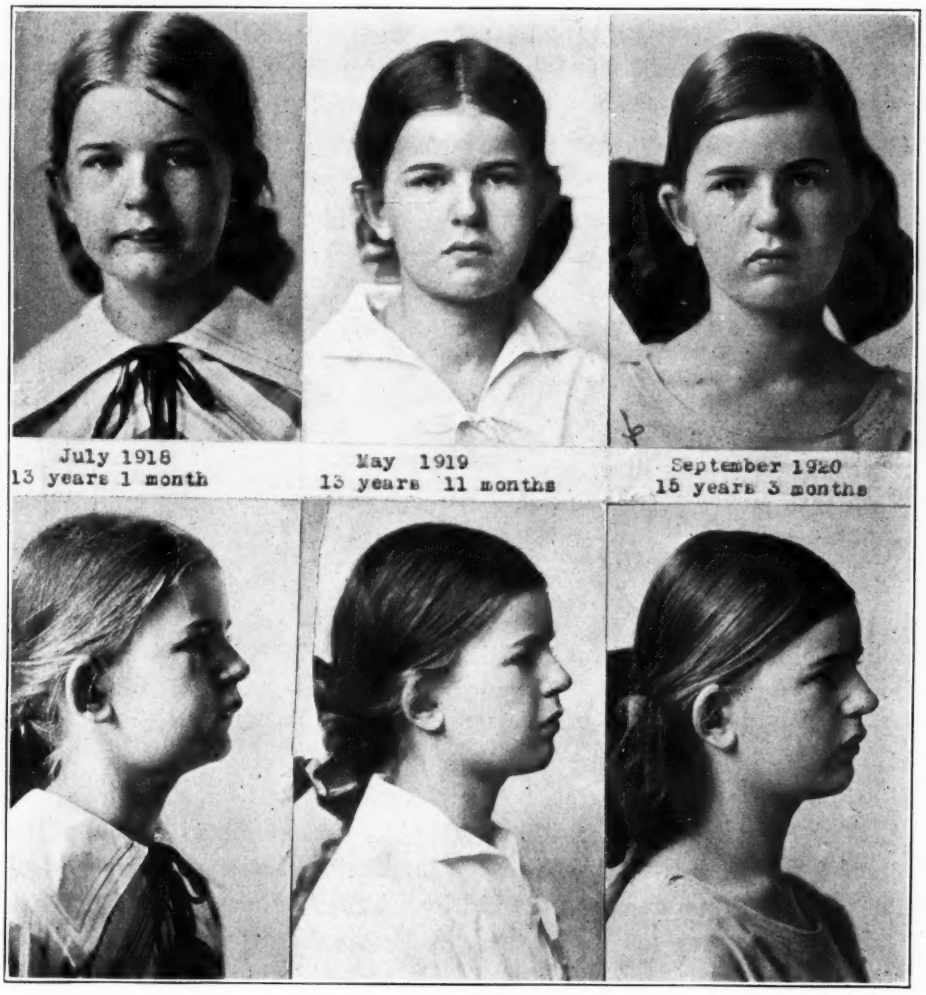


Fig. 2.—Case 2. V. L.

Photograph shows profile and front view of face.

Classification of oral and facial deformity: bilateral distoclusion complicated by labioversion of maxillary incisors.

Family history: father and mother both living and in good health, about forty years of age; two other children, boys, normal in every respect. The only evidence of a positive nature secured in the family history was that of a neurotic tendency on the paternal side of the family, although both of the parents themselves were of an unusually strong intellectual poise.

Personal history: the patient had been breast-fed throughout the nursing period. The habit of thumb-sucking had been acquired during infancy and was persisted in for several years. Hypertrophied tonsils and obstructive adenoids were removed when the child was nine years of age. Up to the age of six years, physical and mental development were apparently unimpaired. It was at about this time that the prenatal neurotic tendency became noticeable. The first school year disclosed the child's mental retardation and inability to readily absorb instruction. In the several years following the child displayed subnormal development, which was not corrected by the most painstaking efforts in private tutoring. The habits of personal hygiene, rest, exercise and nourishment had been carefully guarded and supervised with unusual intelligence, but the child was still unable to compete with a normal child of her age.

Natural growth was not conspicuously retarded, the child being 4 feet 10¾ inches in height, and weighing 77¾ pounds. Aside from the oral defect contributing to the facial deformity, there was a peculiar dull apathy of expression and a lack of interest in the mental and physical activities common to childhood. Sleep was irregular and heart action quite rapid, accompanied by a variation in temperature generally above normal, running two to four-tenths above 99°. The survey as given aroused a suspicion that constitutional disturbances of some nature were working in combination with the prenatal neurotic tendency before mentioned. The case was then referred for a general medical investigation, the most important findings of which are as follows:

Temperature, 99.4°; general attitude, slightly stooped; adipose tissue, scant, though the patient was fairly well nourished; capillary circulation, somewhat below normal; throat, healthy; tonsils and adenoids removed when nine years of age; pulse rate, 120; pupillary reaction, normal; phonation, normal; lymph nodes, not involved. The chest and abdominal findings were negative. The urinalysis and blood count showed no change from normal. Systolic blood pressure registered only 96. Menstruation was not yet established. The result of the more thorough physical examination was quite suggestive of functional disturbance of the internal secretions. A more accurate diagnosis might have resulted had a basal metabolism test been run, but such advantages were not to be had in Peoria hospitals or clinical laboratories at that time. A tentative diagnosis of endocrine deficiency was made and polyglandular therapy instituted. Over a period of fourteen months a combination of adrenal, thymus, thyroid and ovarian extracts were administered with intervals of interruptions. Orthodontic treatment was carried on at the same time. Repeated physical examinations were made during the course of treatment and the findings recorded.

Between July 10, the date of beginning treatment, and August 31, there was no perceptible change in the temperature; it remained around 99.4°, but the pulse rate was down to 90. There had been a loss in weight of 2¼ pounds, the patient at this time weighing 75½ pounds. Height had increased ¾ of an inch during this period of 52 days' treatment.

During the following six months a general mental and physical improvement in the patient was quite noticeable. On March 6, 1919, beginning the eighth month of orthodontic and constitutional treatment, the patient had increased in height 1¼ inches, and in weight 5¼ pounds. At the present time, the patient apparently enjoys normal health, and exhibits a marked mental improvement though not up to one of her years. Her present height is 5 feet, 5 inches and weight 108½ pounds. Body temperature continues normal. While not all that might be desired, the result in this case tends to emphasize the importance of a close cooperation of dental, orthodontic, and general medical science if we would arrive at the end results for which we seek.

Case 3.—D. A., aged seventeen years. The improvement brought about in this case may be attributed to a well directed course in physical training, and to a change of environment which corrected an extreme diffidence, rather

Fig. 3.—Case 3. D. A.

than to the orthodontic treatment. The result of the treatment as shown in the facial expression was accomplished between the patient's seventeenth and nineteenth years of age.

Case 4.—L. M., aged fifteen years, when referred to the Neighborhood House Dental Infirmary of Peoria for the treatment of mouth conditions that seemed to have a direct bearing on her ill health. The occlusion of the teeth and other pathologic conditions of the nose and throat were brought to a fairly normal state, but still the general physical condition of the patient was not improved. It was then decided to try a change of environment and food. Light employment was secured for the patient in a day nursery operated in connection with the medical and dental infirmary for the benefit and care of younger children. All her meals were secured at this nursery where they used the best milk procurable in the city for drinking, and also in the cooking. It was upon this diet that the patient began to show improvement.

Fig. 4 shows fairly well the physical changes brought about through the combined effect of a correction in diet, change of environment, and the orthodontic treatment over a period of fourteen months. In a year and a half

from the time this patient entered this clinic as a charity charge she was self-supporting, and apparently enjoying the best of health.

Case 5.—Winifred K., aged eleven years. Family history: only child; parents both living; neither appear in good health; would suspect the father of being tubercular, though not admitted. Personal history: mouth-breathing evidently from infancy; adenoids removed when nine years of age; at no time

Fig. 4.—Case 4. L. M.

in life well nourished; generally considered anemic; attendance at school irregular.

The case was referred to the family physician for a general physical examination. The report returned was to the effect that the child was running a temperature above normal and the case was diagnosed as an early stage of pulmonary tuberculosis. The malocclusion being a bilateral distoclusion, and the mandibular incisors seriously irritating the soft tissues lingual to the incisors of the maxillary arch, it was imperative that orthodontic treatment should not be delayed. With the beginning of orthodontic treatment, the

child was removed from the city to a country home where under the physician's directions every advantage of open air, rest and limited exercise could be successfully supervised. This arrangement, with a diet principally of fresh milk and native fruits and vegetables, may be credited with bringing about the healthful changes shown in the patient following a course of four months' dietetic and orthodontic treatment.

Fig. 5.—Case 5. W. K.

Case 6.—B. K. Date of consultation and examination, May 14, 1920; age, twelve years, 9 months; height, 63½ inches; weight, 92 pounds. General appearance: adipose tissue, scant; very anemic; attitude, slightly stooped. Classification of malocclusion: neutroclusion complicated by linguoversion of

the mandibular incisors. Nose and throat: hypertrophied tonsils, infected; adenoids obstructive to nasal respiration. An immediate operation for the removal of the adenoids and tonsils was advised. The advice given was acted upon.

While the patient resided on a farm where dairy products, eggs, and

Fig. 6.—Case 6. B. K.

vegetables were the chief products and main diet of the family, there had been an aversion on the part of the patient to drinking milk, using butter or eating eggs. The selection of vegetables was quite limited. It was insisted upon that the patient cultivate the habit of drinking milk, and she was directed to follow instructions relative to a balanced diet before orthodontic treatment was started.

The appliances were set for the beginning of orthodontic treatment the following month, June 16, and actively continued over a period of fourteen months, when the second photograph was taken on August 29, 1921, and a postmaintenance appliance put upon the teeth. There was a general physical and mental improvement of the patient as the habits of diet were corrected, and the orthodontic treatment progressed. During the latter part of the treatment acne vulgaris developed and was quite noticeable on the face at the time the second photograph was taken in August, 1921. The dermatologist consulted did not associate the occurrence of the acne with the increased butter fat consumed in the diet prescribed, but rather to a condition common to the age of the patient. The skin condition responded favorably to treatment and has since been completely cured.

A CASE WHERE THUMB SUCKING HAD CAUSED DISPLACEMENT OF THE PREMAXILLARY BONES CORRECTED BETWEEN THE LOSS OF THE TEMPORARY INCISORS AND THE PARTIAL ERUPTION OF THE PERMANENT ONES*

By Dr. W. K. Slater, Knoxville, Tenn.

JOHN T., aged eight years, who was addicted to the habit of almost constant thumb sucking, was brought to my office for orthodontic treatment. Upon examination it was found there was no bony union between the maxillary and the premaxillary bones, as a distinct movement could be produced

Fig. 1.

Fig. 2.

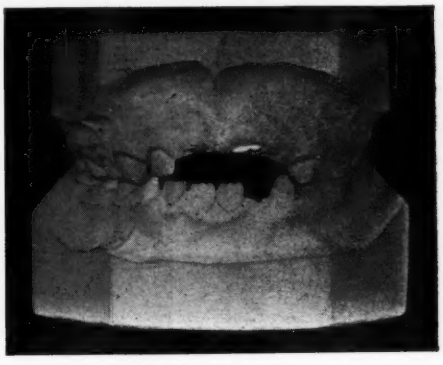


Fig. 3.

Figs. 1, 2 and 3.—Show the right, left and front views of models at the beginning.

by grasping the alveolus in the incisor region. The premaxillary bones had been forced forward about 3 mm. and, of course, the teeth were carried with them. What I had to decide was whether I would wait until the teeth came through and try to force them bodily to place, or work out something that

*Read before the American Society of Orthodontists at Chicago, Ill., April 24-26, 1922.

would slowly move the bone backward and allow the teeth to erupt in their correct positions.

In thinking the matter over, I remembered having seen an illustration of a device where a framework of wire was used over which was stretched a piece of rubber dam, and this was where I got the idea.

When the case was submitted to Dr. Eby, he wrote me and mentioned this same device which was used for drawing in a maxillary protrusion, and said we were indebted to Dr. A. LeRoy Johnson.

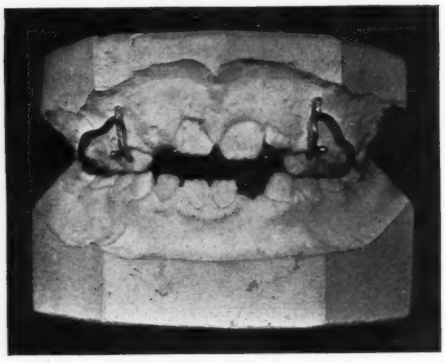


Fig. 4.

Fig. 5.

Figs. 4 and 5.—Front and side view of appliance on the model.

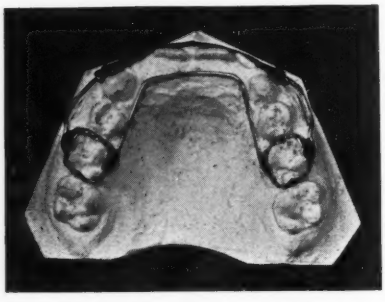


Fig. 6.

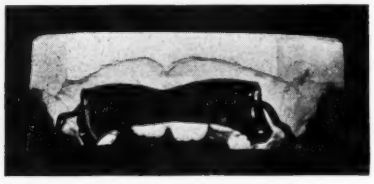


Fig. 7.

Fig. 6.—Shows palatal view of appliance with rubber dam in place.
Fig. 7.—Shows front view of appliance with rubber dam in place.

Fig. 8.—Shows models before and after treatment.

Bands were made for the maxillary second deciduous molars, a model made and a lingual arch soldered in. This prevented the anchor teeth from rotating and also took the thumb pressure, transferring it from the premaxillary bones to the anchor teeth. Next, on either side a wire was soldered to

the buccal surface of each band and bent upward and forward to the region of the canine. On the ends of these another wire was soldered, forming a capital T. with points projecting backward; between these, a piece of rubber dam was stretched, being cut about one-fourth of an inch short. The dam was renewed twice a week by myself, as it was found necessary to tie it on, but in a later case a supply was given the mother and the changes were made at home. There was no irritation of the soft tissues under the rubber, but care had to be exercised in shaping them to prevent the upper edges from cutting.

In about six months the model on which the appliance is shown was made, and at this time a high labial wire with finger springs was put on to act as a retainer; also to help guide the teeth into place, but that is another story. The patient was in a few days ago and union seems to have taken place between the bones ten months after the beginning of treatment.

DEPARTMENT OF ORTHODONTIC TECHNIC

Edited By
H. C. Pollock, D.D.S., St. Louis, Mo.

ELEMENTARY ORTHODONTIC TECHNIC

By H. C. Pollock, D.D.S., St. Louis, Mo.

(Continued from April issue.)

A TECHNIC FOR FITTING PLAIN OR MAGILL BANDS TO MOLAR OR ANCHOR TEETH FOR FIXED APPLIANCES (CONTINUED)

FOLLOWING is an excerpt from Pullen's article (*International Journal of Orthodontia, Oral Surgery and Radiography,* October, 1921, vii, No. 10).

"When the proper size of band is found, it should be flattened slightly mesially and distally with the flat nose pliers, and placed with soldered joint

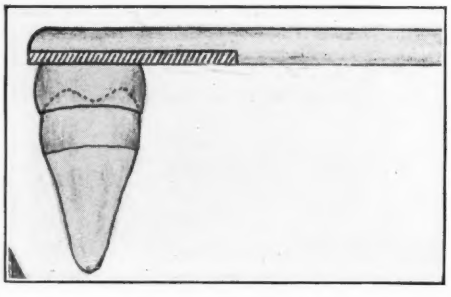


Fig. 7. (Pullen.)

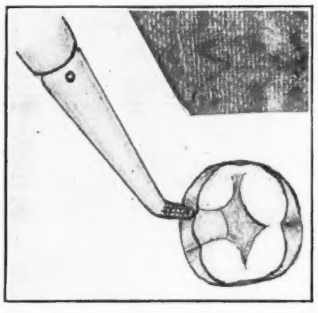


Fig. 8. (Pullen.)

buccally over the crown of the molar, and with the band setting instrument should be forced between the proximate contacts of adjoining teeth, and rocked into place as far as the gingivæ as illustrated in Fig. 7. The writer uses an all metal band setter with a piece of pure tin soldered on the end as in Fig. 7 to catch the edge of the molar band and prevent slipping.

"*Trimming and Contouring the Bands.*—While the molar band is in this position, it can be noticed whether it impinges upon the gum tissue mesially or distally and if so, it can be trimmed to relieve this impingement at once. The band should then be replaced upon the tooth, and burnished into all of

the buccal and lingual grooves, with the serrated burnisher designed by Dr. J. Lowe Young, as illustrated in Fig. 8.

"At no point should the band be allowed to cover over the occlusal surface of the molar as occlusion upon such overlapping edges wears away the cement and leaves a lodging place for food and detritus.

"*Band Removing and Contouring Pliers.*—The band should next be removed with the band removing plier, Fig. 9, a design of the writer's, and contoured buccally and lingually with a special contouring plier, Fig. 10. The finished band, trimmed and contoured, should appear as in Figs. 11 and 12."

Materials for Plain Anterior Bands Used for the Purpose of Securing Means of Attachment of the Teeth to the Appliance.—Discussions of materials and alloys most universally used for anchor bands have appeared in previous pages of these articles and references have been given to various au-

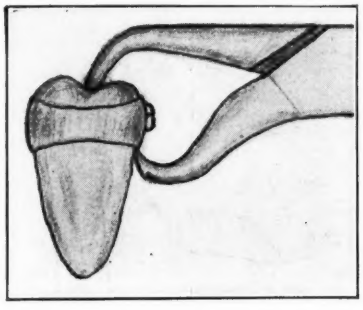


Fig. 9.—Method of removing a plain band, when cemented to place with temporary cement. This is a very simple process. (Pullen.)

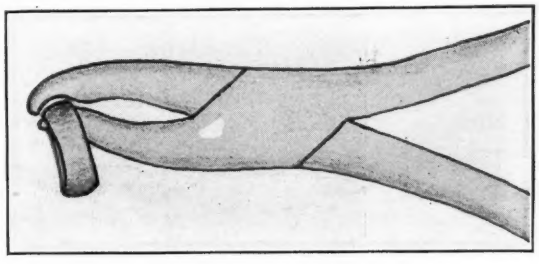


Fig. 10.—Pliers for contouring plain bands. (Pullen.)

Fig. 11.—Band after completion. (Pullen.)

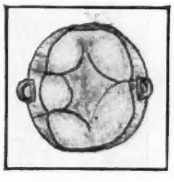


Fig. 12.—Plain band fitted with soldered attachments. (Pullen.)

thors upon this subject. Many points made in the discussion of anchor bands apply equally well to materials used for plain anterior bands. However, if we are to be governed by the practice of the great majority of orthodontists it is reasonable to assume that base metal anterior band material of any kind has no place in modern orthodontic technic, it being corrosive, unsightly, unclean and a relic of the past.

Many alloys of gold, platinum, iridio-platinum and of gold and base metal are on the market for this purpose, being of various thicknesses, widths and colors; they vary in composition from that of fine gold to that of pure platinum, the materials approaching more of a platinum color seemingly being the more in demand, the platinum color more pleasantly harmonizing with the white color of the teeth as well as being more nearly in accord with the color of the more popular alloys used for orthodontic wire and attachments at this time.

In general it may be said that these materials should be thin, pliable and susceptible of being easily burnished and at the same time tough and durable. A thickness of .003 of an inch is many times used in this material provided the alloy is sufficiently sturdy to carry this delicate thickness. Metallurgists connected with various manufacturing concerns have carried on an immense amount of research with precious metals for this particular purpose, consequently the market affords excellent and satisfactory materials for use as anterior band material. The choice of a material then for this purpose is purely a matter of taste and opinion of the individual operator.

Technic for Construction of Plain Anterior Bands.—This subject is well described in most any of the current standard text books on orthodontia. A summary in short, however, on a subject in which there seems to be no marked difference of opinion will suffice in that the band material is adapted

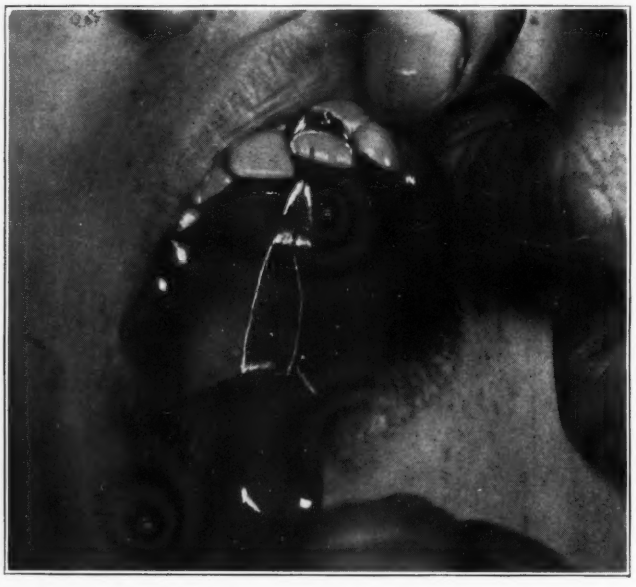


Fig. 13.—Making pinch for plain band with seam on the lingual surface.

about the tooth by means of the fingers, the free ends of the material extending either toward the lingual or toward the labial direction depending entirely upon where it is desired to place the finished soldered seam. For bands upon which labial soldered attachments are to be anticipated the lingual seam is always indicated. (Fig. 13.) The lingual seam has the added advantage of being inconspicuous as well as presenting the appearance of a better finished piece of workmanship. The material after being manipulated to place with the fingers is then drawn tightly with the band forming pliers, at the same time well burnished to the tooth, removed from the tooth, and soldered. It may then be returned to the tooth in the mouth, reburnished, removed, seam filed or ground down and smoothly finished.

Some authors have advocated the construction of these bands upon the artificial stone model by the indirect method. However, it is obvious ante-

rior bands may be more accurately and conveniently fitted directly upon the tooth in the mouth. Fig. 14 illustrates the labial seam pinch.

It is pertinent to here point out that the possibility for decalcification of tooth structure under anterior bands which are not carefully fitted and burnished to the tooth, is not to be ignored. If space is allowed to remain between the band and the tooth, the space created thereby filled in with cement, the cement may disintegrate during a period of weeks and months, hardly be detected by the eye, and as a result incident thereto, decalcification

Fig. 14.—Making pinch for plain band with seam on the labial surface.

Fig. 15.—Finished plain band with seam on the lingual surface.

occur to a greater or less degree. There is still another hazard for which to be alert, particularly if a base metal should be used. On account of corrosive and chemical reactions, a discolored line of demarcation may be left in the form of a fine line across the tooth at the margin of the band encircling the tooth. Such lines may penetrate into the enamel rods and be very difficult, if possible at all, of complete obliteration after the bands are removed.

When the accusing finger of guilt is pointed to orthodontic appliances as having been responsible for tooth decalcification, decay or enamel stains

and such contention can be reasonably sustained, it may usually be laid to the door of faulty mechanical technic of construction or cementation of an appliance. Bands, particularly anterior bands which have been cemented to place to do service for a period of months, should be checked up from time to time by the operator in order that he may ascertain whether joints and spaces between band and tooth structure are properly and thoroughly sealed with cement. In the event defects are discovered, the band should be

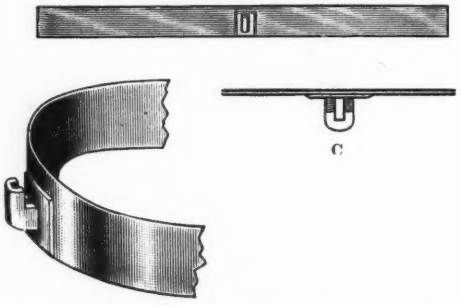


Fig. 16.—Bracket bands as designed for the ribbon arch, the ribbon being engaged in the bracket and held to place by a small pin. (Angle.)

Fig. 17.—Making soldered attachments to plain anterior bands, spurs, lugs, ferrules, etc. Method of soldering. (Dewey.)

promptly removed, the defect repaired and recemented to place. By way of parenthesis the above caution should also be extended to cover the checking up of all points of enamel structure wherein orthodontic wires and other devices may come in contact with a fixed point or line of tooth structure over a period of months. The orthodontist is cautious of these points intuitively as experience has been his teacher in some instances.

Manufactured Plain Anterior Bands with Patented Fixed Attachments.—These bands are supplied by the manufacturers with bracket attachments soldered

upon their labial surfaces for the particular use of the ribbon type of appliance. They are supplied with bracket attachments already soldered to place to sections of a reinforced band material, each section cut in a convenient length to make a band for a single tooth. The band is strengthened in the region of the attachment or the bracket where the strain is concentrated and is made thinner where the strain is less, as between the approximating surfaces of the teeth. This band is beautifully made, constructed with care and precision by the manufacturers. However, its use is limited to the ribbon type of appliance. (See Fig. 16.) (Dental Cosmos, Vol. lviii, No. 9, Angle.)

FIXING OF ATTACHMENTS TO ANTERIOR OR POSTERIOR BANDS

In the Event a Spur Is Desired for the Attachment of Ligatures, a Lug for Finger Springs, or Other Fixtures to be Placed on Bands.—A piece of wire is secured and the end of the wire filed on the bias. A very small ball of solder is then flowed upon the end of the wire by heating the wire to red heat, then touching the end of a wire coil of solder directly and lightly to the end of the wire. The band is held in the pliers, the hands being well braced or supported, both pieces heated equally to the fusing point of the solder, the wire then lightly touched to the band and the solder allowed to flow as desired after having been well covered with flux. (Fig. 17.) The wire is then cut off leaving the length desired. Soldering technic of the above character is well and carefully described in all standard text books upon orthodontia. Care must be exercised in placing sufficient amount of wire in contact with the band to prevent the band from subsequently tearing out at the point of the soldered joint. If contact is by pin point surface only and delicate band material used, the hazard of the joint breaking loose is very great when the stress of ligatures and that exerted in ordinary mastication is exerted. Caution should also be employed to prevent occlusal contacts to the anterior bands as well as to attachments soldered thereon, inasmuch as occlusal contacts will wear out and distort attachments in time. After attachments are fixed and bands well fitted they may be driven home with a band driver and mallet. Anterior bands should be festooned in such a manner that the soft tissues are not disturbed by free and sharp edges.

In conclusion of the question of anterior plain bands it has been pointed out by Angle that the position of anterior bands should be relatively placed in such a manner as to be most artistic as well as efficient. Along this line he has suggested that in instances where it is desired to place two or more bands on the anterior teeth a lead pencil mark may be placed on the moist surfaces of the teeth at the point it is desired the incisal margin of each band should occupy when placed in its ultimate position. This results in a harmony of relative position of all anterior bands after having been cemented to place and the teeth moved into conformity with the line of occlusion.

(To be continued.)

DEPARTMENT OF
ORAL SURGERY AND SURGICAL ORTHODONTIA

Under Editorial Supervision of

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SAFETY OF LOCAL ANESTHETICS*

With Particular Reference to Cocaine and Butyn

By Carl Nielsen and John A. Higgins, Chicago, Ill.

AN IDEAL local anesthetic for use in the practice of medicine and dentistry is one which combines universal efficiency with clinical safety, and which is easily soluble, capable of sterilization by boiling, and nonirritating. The professions are familiar enough with the unpleasant experiences with one or the other of the local anesthetics of the so-called "cocaine-group" that have been in common use for years past. This applies particularly to cocaine itself which, in spite of its many dangers, used to be the local anesthetic of choice until equally or more efficient but less dangerous products were developed for the purpose. The progress of recent years in this direction has advanced to the point where the local anesthetic is chosen with preference from among the group of non-habit forming synthetics often termed "substitutes for cocaine"; while cocaine itself is being regarded as a dangerous local anesthetic to be used only when no other is available. Sollmann[1] classifies all these anesthetics under the general term, "cocaine-group." They are all alkamine esters of aromatic acids, but the synthetic ones differ from cocaine in that they are not habit forming.

About two years ago, a new synthetic local anesthetic was introduced and described by Kamm, Adams and Volwiler, 1920,[2] and by Volwiler, 1921;[3] namely, para-amino benzoyl gamma di-n-butyl amino-propanol hydrochloride. This, as well as the succinate of the same base, was investigated pharmacologically by Bonar and Sollmann.[4] Our experiments include in addition to these salts also the much more soluble sulphate (Butyn). These extensive pharmacologic tests and the subsequent clinical trials established the superior efficiency of butyn to cocaine and procaine.

*From the Pharmacologic Department of The Abbott Laboratories, Chicago, Ill.
Received for publication, February 28, 1923.

The first question asked, when such a new local anesthetic is introduced, is naturally, "How toxic is it compared to these?" The physician or dentist usually expects an approximate comparative figure in answer to the question, since unfortunately it often is customary to express the toxicity of local anesthetics in such figures without explaining how they are obtained. Although it has been repeatedly demonstrated that the ratio of toxicity of each of these local anesthetics varies greatly in the different species of animals, and that the toxicity of one and the same anesthetic in the individual species varies according to the concentration and mode of application, yet these arbitrary figures are very often applied as a direct measure for the clinical safety of the anesthetic in human therapy.

Neither the efficiency nor the toxicity of a local anesthetic can be judged from a series of tests on a single animal species. Nor do the toxicity and side actions, as demonstrated on various laboratory animals, offer an approximate measure for the safety or non-safety in human therapy. The synthetic anesthetics, as a rule, present less variation and leave less uncertainty than cocaine in that direction.

TABLE I

SUBCUTANEOUS INJECTIONS IN ALBINO RATS

The solutions used contained 10% of the anesthetics and 0.004% of epinephrin:

ANESTHETIC	M.F.D. IN MG. PER KG. BODYWEIGHT	RATIO OF TOXICITY COCAINE=1
Cocaine	370	1
Butyn	190	2

TABLE II

SUBCUTANEOUS INJECTIONS IN RABBITS

The solutions used contained 5% of the anesthetics:

ANESTHETIC	M.F.D. IN MG. PER KG. BODYWEIGHT	RATIO OF TOXICITY COCAINE=1
Cocaine	200	1
Butyn	55	3-⅔

Bonar and Sollmann[4] in their work on new local anesthetics state: "The current methods of estimating efficiency, toxicity and irritation * * * may render considerable practical service by cutting short the career of distinctly unpromising anesthetics before they are introduced into clinical practice. The final selection of the more valuable from the crowd of the more or less promising local anesthetics is much more difficult. * * * Judgment must be cumulative since it cannot for the present be absolute." The safety of a "promising" local anesthetic can be judged only after long continued clinical experience with it.

We have, during the past five years, investigated a number of synthetic anesthetics prepared by Adams, Volwiler, Kamm and others in their endeavor to find one safer and more universally efficient than cocaine. Our work includes those investigated by Bonar and Sollmann; we also found butyn to be the most promising.

Bonar and Sollmann report the toxicity of para-amino benzoyl gamma di-n-butyl amino-propanol hydrochloride and cocaine as obtained by subcutaneous injections into albino rats and intravenous injections in cats and rabbits. Our investigations include aside from these the subcutaneous toxicity in rabbits, cats and dogs and the toxicity by stomach in cats; the action on blood pressure and respiration was also investigated. The following are extracts from our records, showing the vast differences in relative ratio of toxicity of these anesthetics, according to the animal used, and the mode of administration.

Similar series of tests were conducted with butyn solutions, previously

TABLE III

SUBCUTANEOUS INJECTIONS IN CATS

The solutions used contained 15% of the anesthetics:

ANESTHETIC	M.F.D. IN MG. PER KG. BODYWEIGHT	RATIO OF TOXICITY COCAINE=1
Cocaine	50	1
Butyn	55	1

TABLE IV

SUBCUTANEOUS INJECTIONS IN DOGS

The solutions used contained 15% of the anesthetics:

ANESTHETIC	M.F.D. IN MG. PER KG. BODYWEIGHT	RATIO OF TOXICITY COCAINE=1
Cocaine	45	1
Butyn	55	4/5

TABLE V

INTRAVENOUS INJECTIONS IN RABBITS

The solutions used contained 1% of the anesthetics and were injected at the rate of 1 c.c. in 18 seconds:

ANESTHETIC	M.F.D. IN MG. PER KG. BODYWEIGHT	RATIO OF TOXICITY COCAINE=1
Cocaine	12	1
Butyn	12	1

TABLE VI

INTRAVENOUS INJECTIONS IN CATS

Bonar and Sollmann report the results obtained by Hatcher with para-amino benzoyl gamma di-n-butyl amino-propanol hydrochloride, this salt being termed "H" (butyn is the sulphate of the same base).

ANESTHETIC	M.F.D. IN MG. PER KG. BODYWEIGHT	RATIO OF TOXICITY COCAINE=1
Cocaine	15	1
"H"	15 (approximately)	1

TABLE VII

ORALLY IN CATS (ADMINISTERED IN GELATINE CAPSULES)

ANESTHETIC	M.F.D. IN MG. PER KG. BODYWEIGHT	RATIO OF TOXICITY COCAINE=1
Cocaine	40	1
Butyn	45	8/9

steam sterilized for one hour or autoclaved half an hour at 15 pounds pressure. Neither the efficiency nor the toxicity was influenced by these procedures. In all these tables cocaine is used as a standard = 1 for the ratio of toxicity; it must be understood that the apparent variation in the ratios of toxicity of butyn expressed in this manner are due mainly to the great variation of toxicity of cocaine in these various animals.

This is conveniently expressed in the accompanying graphic illustration of the ratios of toxicity by the subcutaneous method. (Charts 1 and 2.)

It will be seen that butyn subcutaneously is twice as toxic on rats, 3⅔ times as toxic on rabbits, approximately equal in toxicity on cats, but slightly less toxic than cocaine on dogs. Introduced directly into the blood stream in rabbits and cats and orally to cats (Tables V, VI and VII) butyn is about equal in toxicity to cocaine. It is evident that we cannot answer the question

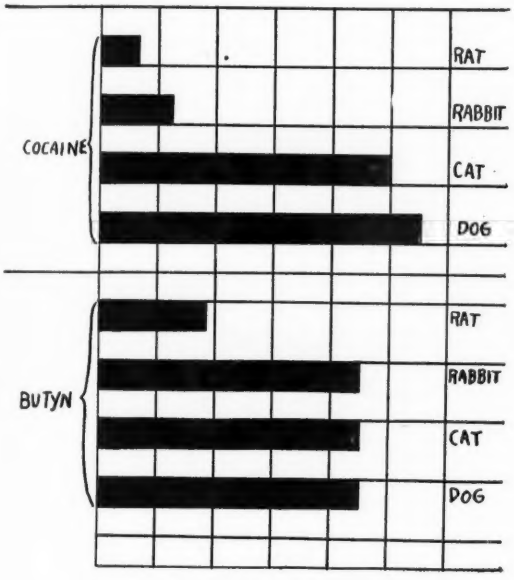

Chart 1.—Showing the comparative variation in toxicity of cocaine and butyn by subcutaneous injection in different animals.

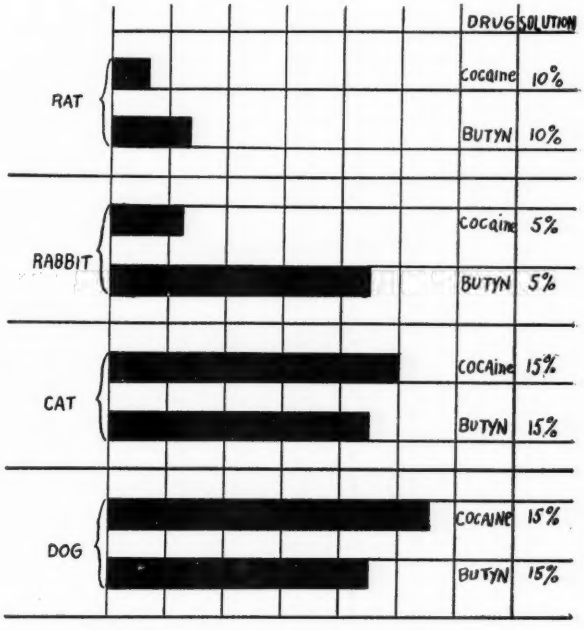

Chart 2.—Showing the comparative variation in toxicity of cocaine and butyn by subcutaneous injection in different animals.

of safety to the human in terms of "toxicity" to experimental animals, since we would be as justified in saying that butyn is equal in toxicity or less toxic than cocaine as we are in stating that it is twice as toxic. The results in the larger animals are as good—if not indeed a better—guide to our judgment. No final conclusion as to the safety of a local anesthetic of this character to the human and the consequent extent of its usefulness, must be drawn from toxicity tests on animals. Such tests are, of course, of great value as preliminary indications, but they are apt to be misleading if confined to one or two species of small experimental animals. This is particularly true as long as we use cocaine, which is so inconsistent in its toxic effect on various animals, as a standard.

Butyn, for example, has a uniform ratio of toxicity subcutaneously in rabbits, cats and dogs, while cocaine becomes more toxic in the same order,

until in the dog it is more toxic than butyn. The toxicity of cocaine is more selective. Dixon[5] has shown that there is a definite relation between the amount of brain substance per weight of animal and the dose of cocaine required to produce convulsions. The convulsions are a result mainly of its action on the neurones of the brain. The higher the development of the brain, the more toxic its action. It requires 20 milligrams per kilogram bodyweight of cocaine to produce convulsions in the dog, but only 12 milligrams to produce a similar reaction in the ape. Our graphic cocaine chart is in conformity with Dixon's findings. In contrast, the butyn chart shows that the minimum fatal dose of this anesthetic is the same per kilogram animal in the rabbit, cat and dog. While cocaine, therefore, according to Dixon's observations, is more

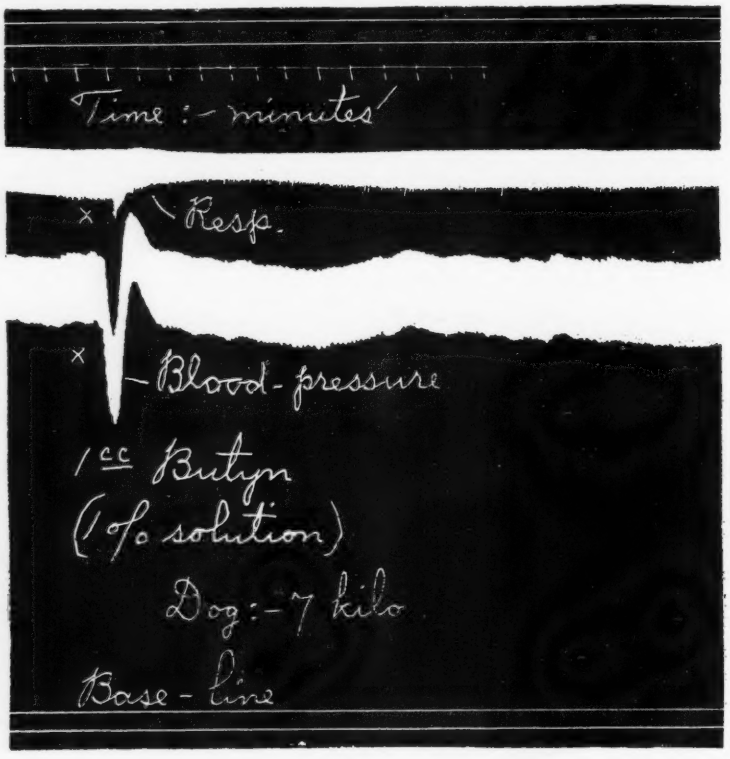

Fig. 1.

toxic to man than to animals, it is improbable that butyn would show great variation—if any. The treacherous action of cocaine in the human on one hand and the degree of safety with which butyn has been extensively used clinically on the other, point in the same direction.[6, 7] So does the comparative action of the two on the blood pressure and respiration.

Figs. 1 and 2 show the effect of cocaine and butyn on the blood pressure and respiration in the same dog. The injections were 1 c.c. of a 1 per cent solution of each anesthetic with 30 minutes interval. Butyn was injected first. It will be seen that butyn caused only a very slight preliminary stimulation, then an abrupt fall for about a minute, followed immediately by a sharp rise to normal. There were no convulsions. Cocaine produced a con-

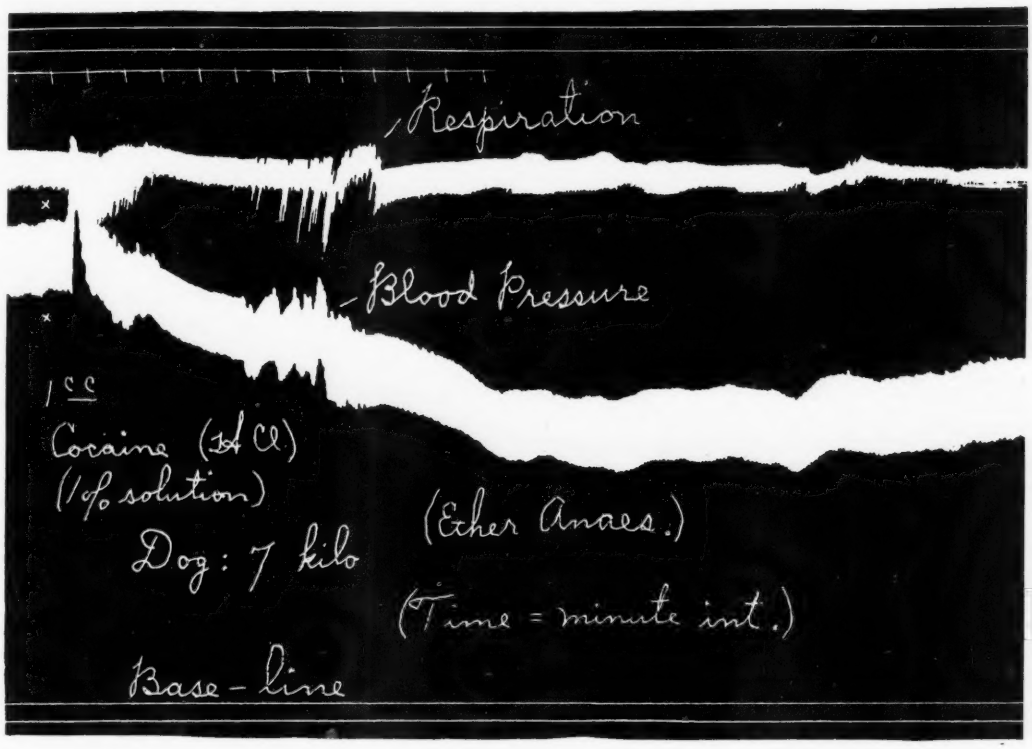
Respiration
Blood Pressure
1 cc
Cocaine (Ht Cl)
(1% solution)
Dog: 7 kilo
(Ether Anaes.)
(Time = minute int.)
Base-line

Fig. 2.

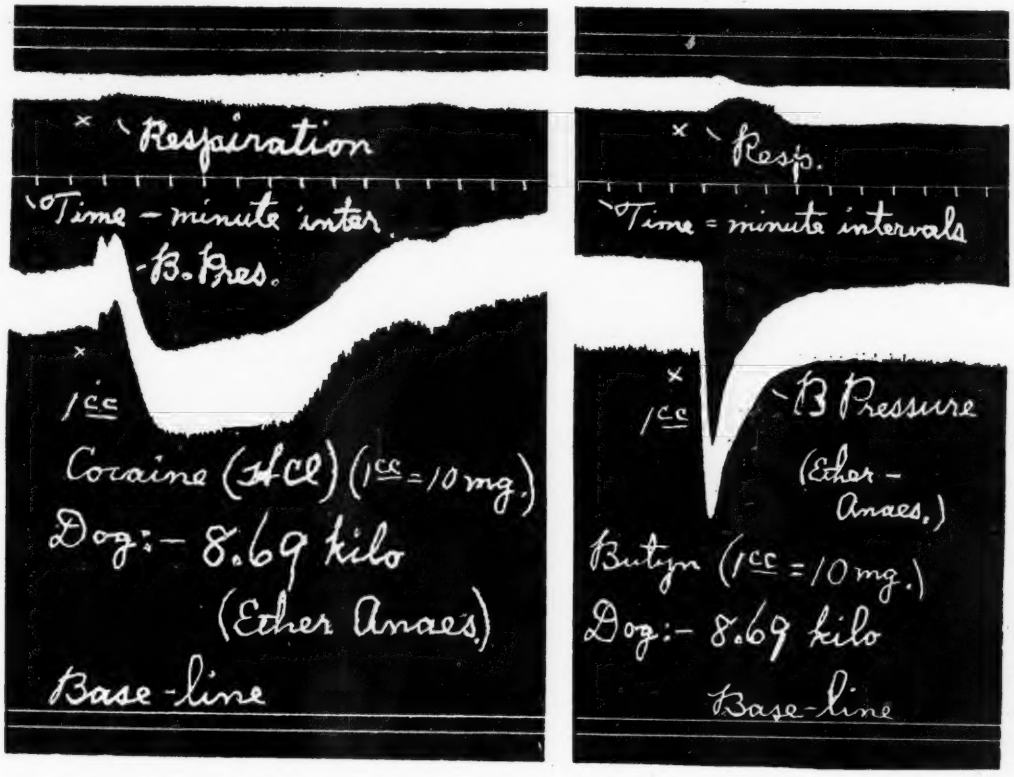
Respiration
Time - minute inter.
B. Pres.
1 cc
Cocaine (HCl) (1 cc = 10 mg.)
Dog:- 8.69 kilo
(Ether Anaes.)
Base-line
Resp.
Time = minute intervals
1 cc
B Pressure
(Ether - Anaes.)
Butyn (1 cc = 10 mg.)
Dog:- 8.69 kilo
Base-line

Fig. 3.

siderable rise in pressure of short duration, then a gradual and long sustained fall, accompanied by convulsions. Cocaine was also more depressing than butyn on the respiration.

In another dog (Fig. 3), the order of injections was reversed, the cocaine again showing a more prolonged depression. In a third and larger dog (Figs. 4 and 5) trichlorbutyl alcohol was used as an anesthetic and 5 c.c. of a 1 per cent solution of the local anesthetics were injected with a three hour interval. Again cocaine was more depressing than butyn. The reactions on this dog are not as distinct, probably due partly to the general anesthetic used.

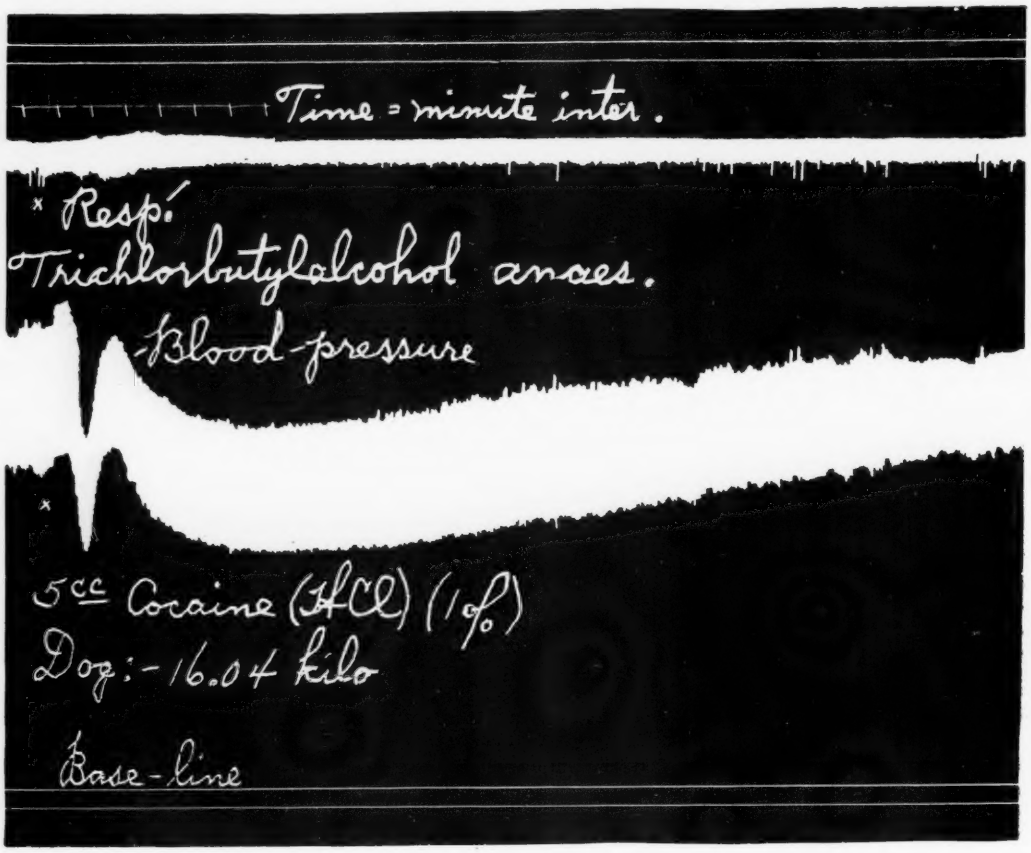

Fig. 4.

In comparing these tracings it should be considered that the amounts injected were the same for butyn and cocaine, although butyn as a local anesthetic, is at least twice as efficient as cocaine in all cases where these anesthetics are applied therapeutically.

Undesirable side actions in patients treated with local anesthetics of this character will occur. They have been too frequent with cocaine and similar cases have been reported even from the use of procaine. Such cases are of course not always directly referable to the anesthetic, and may even be purely psychic in character. Butyn cannot be expected to be an exception to this rule. Years of clinical experience are necessary for proper judgment.

THE USE OF DRUGS IN THE TREATMENT OF POISONING BY LOCAL ANESTHETICS

Several methods of treatment for poisoning by local anesthetics have been proposed, but none of them have been very satisfactory.

Sollmann suggests the following treatment of poisoning by local anesthetics: "If the drug has been taken by mouth, evacuation and chemic antidotes are indicated. If the anesthetic was injected, absorption should be checked by ligation, epinephrin or cooling. If symptoms have developed the head should be lowered; collapse treated by aromatic ammonia and caffeine; convulsions allayed by ether or chloral; and artificial respiration applied as

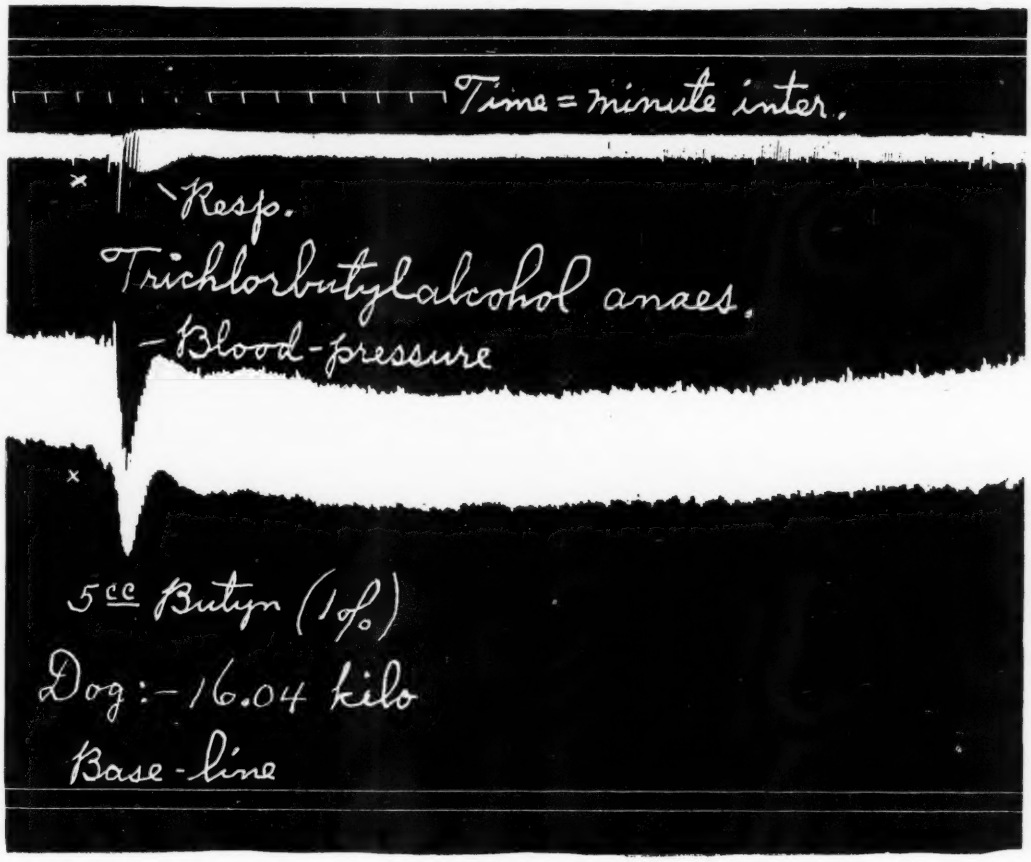

Fig. 5.

needed; amyl nitrite has been recommended. Epinephrin and ouabain, intravenously, and cardiac massage are useful in animals (Eggleston and Hatcher, 1919), but have not been tried sufficiently in the clinic. Whatever delays death, is likely to save the life, in view of the rapid destruction of these products. As prophylaxis the patient should be recumbent, if the operation permits. With nervous patients, it is advisable to inject morphine 15 minutes before the local anesthetic, and to delay the start of the operation till 20 minutes after the injection of the local anesthetic (Mayer et al, 1920)"

We have attempted to find a remedy which would not only prevent undesirable reactions from therapeutic and sublethal doses, but which would

also eliminate convulsions and prevent death from fatal doses. The results of our work are reported in the following:

In the majority of experiments we used butyn as the local anesthetic.

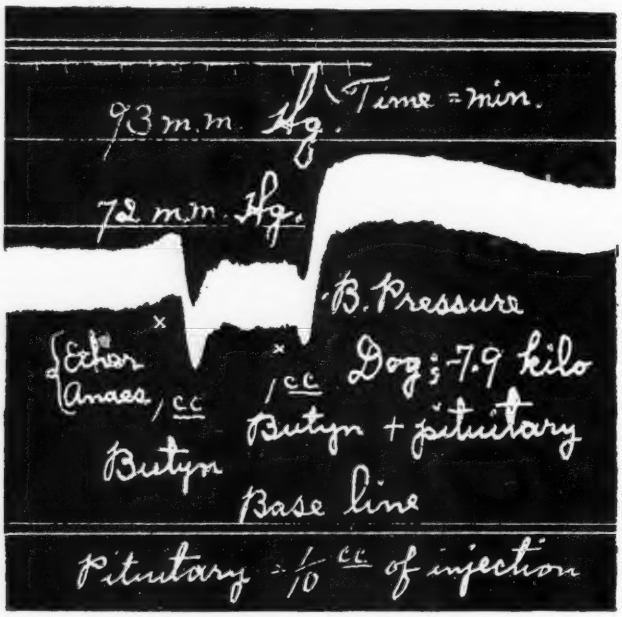

Fig. 6.

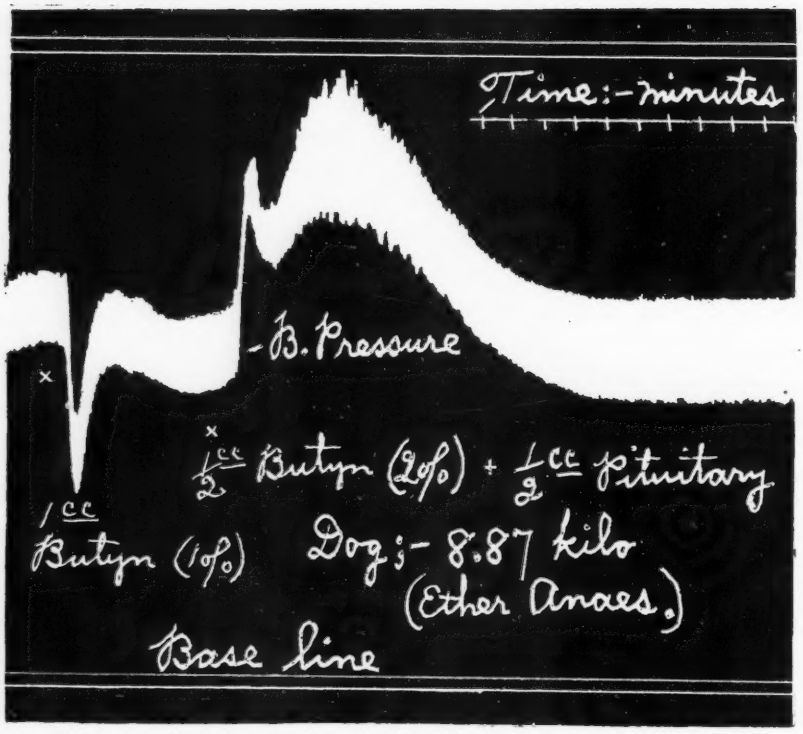

Fig. 7.

It was injected subcutaneously into rabbits and dogs in doses above fatal as well as in sublethal doses, sufficient to produce convulsions.

The following drugs were investigated for their detoxicating action:

Epinephrin
Caffeine Citrate
Hyoscine Hydrobromide
Morphine Sulphate
Atropine Sulphate
Hydrastinine
Pituitary Solution.

The use of pituitary solution was suggested by J. A. Higgins, and since it appeared to be more promising than the others it alone was subjected to further experiments, including its use in cocaine poisoning also.

The pituitary solution we used was taken from samples sent over from our manufacturing department and found to be of the accepted standard activity on the isolated guinea pig uterus, and to produce the required sustained blood pressure rise in the dog.

The minimum fatal dose of butyn subcutaneously in rabbits and dogs is 55 milligrams per kilogram bodyweight (Tables II and IV). The minimum fatal dose of cocaine subcutaneously in dogs is 45 milligrams per kilogram bodyweight (Table IV).

Rabbit No. 2, weight 1.67 kg.; dose 55 mg. of butyn per kg. bodywt.; total dose 0.09185 grams. Total amount of a 5% solution 1.82 c.c. injected subcutaneously at 2:02 P. M. convulsions set in at 2:11 P. M. At the onset of convulsions, 3/4 of a c.c. of pituitary solution was injected intravenously. This injection immediately stopped the convulsions and the rabbit survived the fatal butyn injection.

Rabbit No. 3, weight 1.77 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.1062 grams. Total amount of a 5% solution 2.13 c.c. injected subcutaneously at 11:25 A. M. Onset of convulsions at 11:28 A. M. Injected 1 c.c. of pituitary solution at 11:30 A. M. This injection checked the convulsions in a few seconds and the rabbit survived the otherwise fatal butyn injection.

Rabbit No. 4, weight 2 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.12 grams. Total amount of a 5% solution 2.4 c.c. injected subcutaneously at 1:41 P. M. Onset of convulsions at 1:49 P. M. Injected 1 c.c. of epinephrin solution 1:10,000 intravenously 1 minute after the onset of convulsions. The animal remained quiet for a short period after this injection, but convulsions returned and the rabbit died at 2:38 P. M. Postmortem examination revealed a straw colored serum flowing from the nostrils, a pinkish tinge around the mouth, congestion of the liver, heart veins distended; the lungs contained a small amount of serum, but there was no indication of a rupture of the lung vessels.

Rabbit No. 5, weight 2.05 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.123 grams. Immediately before injecting the butyn, 1 c.c. of a 1% caffeine citrate solution was given subcutaneously (at 1:02 P. M.). At 1:04 P. M. 2.46 c.c. of a 5% butyn solution was injected subcutaneously. The caffeine injection did not stop the convulsions and the rabbit died at 2:04 P. M.

Rabbit No. 6, weight 2.57 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.1542 grams. At 1:55 P. M. a subcutaneous injection of 1/2 c.c. of pituitary solution was given, and immediately following this injection, 3.08 c.c. of a 5% butyn solution was

administered subcutaneously. (1:57 P. M.) The rabbit lies down quietly. No convulsions occurred and the animal was apparently well recovered at 3 P. M.

Rabbit No. 7, weight 1.89 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.1137 grams; total amount of a 5% butyn solution in 2.27 c.c. injected subcutaneously at 2:38 P. M. Convulsions began at 2:46 P. M., and an injection of 1 c.c. of 1% caffeine citrate solution was then administered intravenously. This injection did not stop the convulsions; the animal was still on its side at 4:50 P. M.; it recovered slowly.

Rabbit No. 8, weight 1.7 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.102 grams. In this rabbit the caffeine solution was administered immediately before the butyn (same as in rabbit No. 5). 1 c.c. of a 1% caffeine citrate solution was injected subcutaneously at 3:30 P. M. followed by a subcutaneous injection of 2.04 c.c. of a 5% butyn solution at 3:32 P. M. The caffeine did not prevent convulsions, but the animal survived the fatal dose of butyn and was apparently normal the following morning.

Rabbit No. 9, weight 2.02 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.1212 grams. In this animal the caffeine dose was doubled. One c.c. of a 2% caffeine citrate solution was injected subcutaneously at 10:27 A. M., followed by a subcutaneous injection of 2.42 c.c. of a 5% butyn solution at 10:28 A. M. Convulsions set in at 10:35 A. M., and the animal died at 10:41 A. M.

Rabbit No. 12, weight 1.35 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.081 grams. Immediately before injecting the butyn, the animal received 1/100 of a grain of hyoscine hydrobromide subcutaneously. Total amount of a 5% butyn solution injected subcutaneously 1.62 c.c. The animal had convulsions of a mild type, and recovered (3:45 P. M.) from the fatal dose of butyn.

Rabbit No. 13, weight 1.71 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.1026 grams. Immediately before giving the Butyn injection the animal was given 1/4 of a grain of morphine sulphate subcutaneously. Total amount of a 5% butyn solution injected 2.05 c.c. The morphine did not prevent the convulsions and the animal died 14 minutes after the butyn injection.

Rabbit No. 14, weight 1.73 kg.; dose 60 mg. of butyn per kg. bodywt.; total 0.1178 grams. The animal was first given 1/100 of a grain of atropine sulphate subcutaneously, followed immediately by 2.36 c.c. of a 5% butyn solution subcutaneously. Some convulsive movements of a mild type; the animal tries to get up 47 minutes after the butyn injection. Recovered.

Rabbit No. 16 weight 1.745 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.1047 grams. The animal received first a subcutaneous injection of 1/64 grains of Hydrastinine followed immediately by 2.09 c.c. of a 5% butyn solution. The Hydrastinine did not check the convulsions but the animal survived the fatal butyn dose.

Rabbit No. 17, weight 1.575 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.0945. Immediately before giving the butyn injection, the animal received 1 c.c. of a 1:10,000 solution of epinephrin subcutaneously. Total amount of a 5% butyn solution injected 1.89 c.c. The epinephrin did not prevent the convulsions, but the animal survived the fatal butyn dose.

Rabbit No. 21, weight 2.17 kgs.; dose 60 mgs. per kg. bodywt.; total dose 0.1302 grams; total amount of a 15% solution of butyn 0.87 c.c. injected subcutaneously at 11:31 A. M. No convulsions occurred up to noon, probably due to faulty technic in the injection. At 12:02 P. M. 0.75 c.c. of a 15% solution was injected subcutaneously and at 12:11 P. M. convulsions set in. At this time 1 c.c. of a 1:1000 epinephrin solution was injected subcutaneously. The epinephrin did not prevent the convulsions and the rabbit died at 12:21.

Rabbit No. 18, weight 1.85 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.111 grams. The animal was given a subcutaneous injection of 2.22 c.c of a 5% butyn solution at 4:35 P. M. At 4:44 P. M. convulsions started and at this time 1/100 of a grain

of hyoscine hydrobromide was injected subcutaneously. This injection did not prevent the convulsions and the animal died at 4:52 P. M.

Rabbit No. 19, weight 2.65 kg.; dose 60 mg. of butyn per kg. bodywt.; total dose 0.159 grams. Total amount of an 8% butyn solution, 2 c.c. injected subcutaneously. At the onset of convulsions, 1 c.c. of pituitary solution was injected intravenously. The convulsions immediately ceased, the animal becoming completely relaxed and "flexible." Recovered.

It will be seen from these results that the detoxicating action of pituitary solution was far superior to that of the other drugs. When pituitary solution was given subcutaneously before a fatal dose of butyn was injected, there were no convulsions and the animals recovered. Administering the pituitary solution intravenously after the onset of convulsions from a fatal dose of butyn, it immediately stopped the convulsions and saved the animal from death. The results from these intravenous injections of pituitary solution were so striking and so unfailing, that a series of experiments of this character were demonstrated by one of us (J. A. H.) at the meeting of the National Anesthesia Research Society held in Cincinnati during the week of January 8, 1923. In order to find out whether or not pituitary solution injected subcutaneously after the onset of convulsions from a fatal dose of butyn would be of benefit also, the following experiment was made:

Rabbit No. 20, weight 3.34 kg.; dose 60 mg. per kg. bodywt.; total dose 0.2004 grams. Total amount of a 15% solution of butyn 1.34 c.c. injected subcutaneously at 11:05 A. M. Onset of convulsions at 11:13 A. M. at which time 1 c.c. of pituitary solution was injected subcutaneously. This injection did not stop the convulsions and the animal died at 11:21 A. M.

These experiments demonstrated the desirability of injecting pituitary solution simultaneously with the butyn. A series of dogs were therefore given subcutaneous injections of butyn in doses above the fatal and containing various amounts of pituitary solution. It was found that a relatively small dose of pituitary was sufficient to prevent convulsions and death. Still smaller doses of pituitary solution were sufficient to eliminate the symptoms ordinarily produced by high sublethal doses of butyn.

Dog No. 32, weight 9 kg.; dose 60 mg. of butyn per kg. bodywt.; total 0.54 grams. Total amount of a 15% butyn solution, 3.6 c.c., containing 0.09 c.c. of pituitary solution, injected at 11:17 A. M. No convulsions occurred. There was some incoordination and some excitement. Animal recovered.

Dog No. 33, weight 8.73 kg.; dose 30 mg. of butyn per kg. bodywt.; (high sublethal dose); total dose 0.2619 grams; total amount of 15% butyn solution, 1.75 c.c., containing 0.022 c.c. (approximately 1/45 c.c.) of pituitary solution injected subcutaneously at 1:55 P. M. Bowel movements and vomiting at 2:07 P. M. Animal somewhat excited. Vomits again at 2:30 P. M. Bowel movements at 2:35 P. M. Dog somewhat nervous. No convulsions. Recovery at 3:30 P. M.

Dog No. 34, weight 4.48 kg.; dose 40 mg. of butyn per kg. bodywt. (high sublethal dose); total dose 0.1792 grams. Under ordinary circumstances this dose produces violent convulsions. Total amount of a 15% butyn solution, 1.194 c.c., containing approximately 1/100 of a c.c. of pituitary solution per kg. bodywt. (Total dose of pituitary solution 0.05 c.c.) injected subcutaneously at 10:30 A. M. No convulsions; animal is perfectly

quiet; no excitement. Recovery at 12:15. The animal did not refuse food offered at this time (in contrast to animals who have received high sublethal doses of cocaine, who always refuse food for a long period of time after apparent recovery.)

In view of these excellent results from the use of pituitary solution in treating poisoning by butyn, a few experiments were conducted to show whether it would be beneficial also in cocaine poisoning; if so, it would seem highly probable that pituitary solution would be of equal benefit in the treatment of poisoning by all the anesthetics of this group.

Dog No. 35, weight 5.02 kg.; dose 25 mg. of cocaine per kg. bodywt. This is a high sublethal dose which always produces great excitement, incoordination, extreme anxiety, followed by very violent convulsions. Total dose 0.1255 grams. Total amount of 15% cocaine solution, 0.84 c.c., containing approximately 1/100 of a c.c. of pituitary solution per kg. bodywt. of animal (total dose of pituitary solution 0.050 c.c.). Injection made at 10:50 A. M. Incoordination a few minutes after the injection; the animal was somewhat excited, but no convulsions occurred. Animal apparently recovered at noon, but refuses food.

Dog No. 36, weight 4.82 kg.; dose 50 mg. of cocaine per kg. bodywt. This dose is above fatal. (M. F. D. subcutaneously in dogs 45 mg. per kg. bodywt.) Total dose 0.241 grams. Total amount of a 15% cocaine solution 1.61 c.c., containing approximately 1/100 of a c.c. of pituitary solution per kg. bodywt. of animal. Total dose of pituitary solution 0.05 c.c. A few minutes after the injection there was an increase in saliva; the animal became extremely excited; pupils very dilated. Animal turning its head unceasingly from one side to the other in extreme anxiety; marked incoordination; muscular weakness of hind quarters; animal fell over on one side and was unable to arise. At 12:30 the animal attempted to get up, but was too weak in the hind limbs. Later it finally succeeded in getting up and at 1:30 P. M. the animal moved about in an excited condition; the flow of saliva decreased; the animal refused food; there were some twitching movements of the head, but no convulsions. Animal recovered.

The action on the blood pressure of butyn solution and pituitary solution mixed compared to that of butyn solution alone, is shown in Figs. 6 and 7. In Fig. 6 the dog was given an intravenous injection of 1 c.c. of a 1 per cent butyn solution, producing as usual an abrupt fall in blood pressure. Five minutes later another 1 c.c. of a 1 per cent butyn solution, containing $\frac{1}{10}$ of a c.c. of pituitary solution was given; this injection caused only a very slight fall of blood pressure followed by an immediate high and sustained rise.

In Fig. 7 a dog received 1 c.c. of a 1 per cent butyn solution intravenously, producing an immediate abrupt fall in blood pressure; a few minutes later an injection of $\frac{1}{2}$ c.c. of a 2 per cent butyn solution mixed with $\frac{1}{2}$ c.c. of pituitary solution was injected intravenously and this injection caused an immediate and high rise of blood pressure. The blood pressure did not fall below normal thereafter.

CONCLUSIONS

The safety of a local anesthetic in human therapy should not be judged from its toxicity compared to cocaine on experimental animals.

In determining the toxicity of a local anesthetic on animals, as many different species as possible should be investigated, preferably higher experimental animals. The toxicity should not be measured by comparison with

cocaine as a standard without taking into account the fact, that cocaine is highly selective in toxicity, that is, the higher the development of the brain in the animal, the more toxic is the cocaine. The comparative variation in toxicity depending upon the species of animal, mode of application, concentration of solution, rate of injection, rate of absorption, rate of destruction in an excretion from the body, as well as the comparative action on blood pressure and respiration, should be determined.

With these pharmacologic data in mind, final judgment on the safety and the field of usefulness of a promising local anesthetic in human practice, should be passed only after sufficient clinical experience.

Various drugs were investigated for their detoxicating action in the treatment of poisoning by the local anesthetics of the so-called "cocaine group" (alkamine esters of aromatic acids). Pituitary solution appeared to be superior to the other drugs investigated, and holds out promise both as a preventive of undesirable symptoms from sublethal doses as well as an antidote in poisoning by fatal doses of these local anesthetics. Judging from our experiments, small therapeutic subcutaneous doses of pituitary solution injected simultaneously with the local anesthetic are sufficient to eliminate the fall in blood pressure from therapeutic doses as well as the convulsions from higher doses, and death from fatal doses. Used as an antidote in cases where the convulsions have already set in, pituitary was effective only when administered intravenously. It deserves clinical trial. It should, of course, not be used in pregnant or in high blood pressure patients.

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CANCER OF THE TONGUE, LIPS AND CHEEK

A Résumé of Recent Literature

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CANCER OF THE TONGUE

CARCINOMA of the tongue is more common than is generally believed. Jesset places it second only to cancer of the cervix, while Jacobsen gives it third place. Like carcinoma arising in other parts of the mucous membrane of the mouth, cancer of the tongue is usually of the squamous cell type. The growth may occur on any part of the tongue, but practically all writers agree that the anterior half is most frequently involved and that it occurs on the sides of the tongue more often than on the dorsum. Growth is rapid and dissemination early, probably due to the rich vascular and lymphatic supply. Heidenhain places emphasis on the constant movement of the tongue as the chief factor in the quick spread of cancer of that organ. The lingual muscles are contracting almost constantly and as a result, cancer cells are forced along the lymph spaces to healthy tissues. Judd states that on injecting any area of the tongue, the dye is carried to all glands within the lymphatic system of the tongue, so that the nodes on either or both sides may become involved from a growth on any part of the tongue. This does not correspond closely to clinical observations. In Butlin's classic series it was shown that early carcinoma in the anterior portion of the tongue seems for a long time to be limited by the median septum of the tongue and rarely involves the lymph nodes on the opposite side. Behind the foramen cecum this unilateral involvement does not hold.

The lesion in early carcinoma of the tongue is found to be a chronic one, perhaps an ulcer, not very painful and remaining of the same size for a period of two or three months. Butlin's description of the lesion is an excellent one. "If, as is not unusual, the lesion is situated on the border of the tongue, it often stands out on a slightly raised base; or if a fissure, makes its place known by a slight prominence of that part of the border. Either from ignorance on the patient's part, or through ill advised treatment, it is irritated and then it slowly enlarges, the surface of the open sore becomes uneven, the fissure becomes deeper and more ragged, and the surrounding area becomes a little inflamed, but—and this is one of the most important features—the surrounding tissue becomes harder and harder. From this time on it may increase rapidly and may unfold one by one such signs of carcinoma as cannot be mistaken. Occasionally, even at this stage of the disease, the changes in the sore are accompanied by enlargement of one of the glands beneath the jaw and this renders the prognosis of the sore much more

grave." Pain may be present before any macroscopic finding is noted. It increases gradually and when ulceration sets in usually becomes very severe. Finally the floor of the mouth becomes involved, there is dribbling of saliva, increasing difficulty in mastication, deglutition and speech. There is also marked fetor oris. In unoperated cases the average duration of life is about one year.

The diagnosis of carcinoma of the tongue should not be difficult for the experienced clinician, with the possible exception of a few of the earliest cases; and in these few instances the lesion is so early that it can be removed in its entirety by a simple local operation and the tissue subjected to microscopic study. In a recent paper Taussig remarks, "It is frequently difficult to differentiate syphilis, cancer and tuberculosis of the tongue clinically. As a rule the luetic lesion develops most frequently on the dorsum of the tongue, while cancer is most common on the sides. The blood Wassermann and therapeutic test should be done in every case where there is doubt." The fact that statistics show tongue cancer to occur more often on the sides than on the dorsum does not aid very materially in diagnosis; nor is the blood Wassermann reaction of any aid where there is doubt as to the cancerous nature of a lesion, since a four-plus Wassermann does not exclude cancer. Finally, the therapeutic test. This has been the cause of more unjustifiable delay in the treatment of cancer of the tongue than any other factor. As has already been noted in the preceding review, delay in proper treatment after the onset of a malignant lesion reduces the chances of cure in operable cases from 62 to 12 per cent and increases the chances of postoperative death from 5 to 30 per cent. Butlin, referring to the therapeutic test in the differential diagnosis of cancer from syphilis of the tongue, says, "Weeks are allowed to pass in this manner until the lesion has clearly shown that it is not in the least way affected by antiluetic treatment and perhaps has implicated the lymph nodes. The period at which it should have been removed was allowed to pass and the operation was undertaken when the prospects of ultimate success were exceedingly small.

The greatest change or rather addition to the treatment of malignant tumors about the oral cavity during recent years has been the increasing use of radium and x-ray. In a recent article on the treatment of cancer of the tongue Quick draws the following conclusions: (1) In the treatment of the primary lesion of carcinoma of the tongue he feels very strongly that surgery occupies no place and that this part of the disease belongs entirely to the radium field. (2) In patients having no enlarged nodes, radiation of the neck externally is used, with the idea of destroying minute metastatic foci, and in those where palpable glands have already appeared, with the hope of rendering the disease in this location temporarily less malignant and a safer operative risk. (3) In cases where no cervical nodes are palpable nothing is done, or the treatment confined to external radiation only. The patient is kept under observation. If a palpable node appears which is clinically malignant and not simply inflammatory, a complete dissection of that side of the neck is done under local anesthesia, removing the entire chain of nodes

and burying small doses of radium emanation at all suspicious points in the wound, especially at the points where the lymphatic channels have been severed. (4) While we sometimes see remarkable clinical cures following the surgical removal of such masses, Quick believes that these are more or less accidental and that as a whole the results are very unsatisfactory. (5) In certain cases where a single node appears late in the course of treatment and is well confined to either the submaxillary or cervical groups, a limited dissection of one or the other groups is done burying radium as before. Judd and New feel that "There can be no question concerning the value of the use of radium in the treatment of malignancy under certain circumstances, but clearly operable cases should not be treated with radium. All patients whose conditions are inoperable are given radium treatment or advised to take such treatments elsewhere." Ochsner too advises "That in late cases in which complete removal with the cautery seems impossible, radium needles should be implanted forming a circle entirely around the growth. X-ray should be applied to both sides of the neck.

Simmons of the Huntington Memorial Hospital for the Treatment of Cancer, in Boston, summarizes the views concerning the treatment of cancer about the oral cavity held at that institution as follows: "We have been disappointed in the results obtained by the use of radium as a curative agent, and do not advise its use in early cases. Of twenty-one cases of what might be called early cancer treated with radium, only two are living without evidence of disease over three years. In one the growth was small and of the papillary type; another was a small postoperative recurrence and it was necessary to keep the patient under morphine for six weeks, on account of pain due to the radium reaction. The same results could have been obtained in a shorter time with the cautery. In all cases in which there is a possibility of cure we are advising radical operations done in two stages, the local growth is removed with the knife and cautery and ten days later a radical neck dissection is done."

In taking this position, Quick backs the unproved virtues of even unlimited quantities of radium against all previous surgical observations and against the clinical practice of almost all surgeons.

It is too early to accept such data and teachings as Quick has put forth, unreservedly. Just at present an uncalculable amount of harm is being done, both to patients and to the therapeutic standing of radiation by the injudicious use of both radium and x-ray. Many a growth that is either precancerous or only mildly malignant has been changed to one of extreme virulency and many an early operable condition has been carried into the inoperable stage while undergoing treatment with rays of insufficient strength to favorably influence even those suited for radiotherapy. It will take a large series of cases observed for a considerable period of time to prove to us that results can be obtained by treating the primary lesion in cancer of the tongue by radium alone which are better than those of the series of operated cases reported by Butlin and Judd. Most students of cancer are at present in favor of the use of efficient radiation in conjunction with the radical removal

of the lymphatics, but we do not know of another man of large experience who does not feel very strongly that the ideal time to remove the cervical lymphatics in the presence of active cancer is before the nodes become palpable. While most operators agree that the unilateral cancerous lesion of the tongue anterior to the circumvallate papillae may be treated by a one-sided removal of the lymphatics, the idea of selective removal of nodes is pretty generally condemned, both on account of the uncertainty as to its effectiveness and because the well planned thoroughly radical operation, embracing the whole of one side of the neck can be carried out almost as quickly and as safely as any possibly effective operation in a single group. Finally, most operators will consider it exceedingly difficult, if not impossible, to distinguish in an individual case between a purely inflammatory enlargement of a lymph node and a possible carcinomatous involvement.

So far as results by purely surgical methods are concerned, Butlin in a review of 168 cases, traced 57 recoveries for periods varying from three to twenty-two years, without recurrences, which is over 33 per cent cures with an operative death rate of 10 per cent. In the last 77 cases, 32 were successful, giving 41.5 per cent cures in cases subjected to a radical operation and traced for over three years. Judd and New have recently reported the results at the Mayo Clinic between 1910 and 1922. In early cases the patients almost invariably do well while in advanced cases the results are less favorable, and yet a certain proportion of patients even in the late stages can be cured and should be given the chance. Of 118 operable cases 52 patients at an average age of 52 years had involved nodes at the time of operation, 30.8 per cent of these patients are well and free from disease more than three years after operation. Bloodgood, in a series of 260 cases, reported 62 per cent of five-year cures in patients operated upon in the early stages and 12 per cent of five-year cures in advanced cases. Capetti analyzed 777 cases in which operation has been done at various places and in all stages of the disease. Eighteen per cent of these were free from trouble at the end of three years.

(To be concluded.)

DEPARTMENT OF
DENTAL AND ORAL RADIOGRAPHY

Edited By
Clarence O. Simpson, M.D., D.D.S., and Howard R. Raper, D.D.S.

THE SCIENCE OF DENTISTRY AS "IT IS WRIT"

By C. Edmund Kells, D.D.S., New Orleans

DENTISTRY is supposed to be a science, and, as a science, it likewise is supposed to have a nomenclature of its own.

Each and every science and art known today is supposed to have its distinctive nomenclature, originated or adopted, as the case may be, by its own *leading spirits.* Hardly any one would question the right of the American Society of Electrical Engineers to coin new electrical terms, as the advance in the science requires them. Hardly any one would question the right of the American Society of Architects to create needed new words or terms, as the advance in its science renders them necessary. Hardly any one would question the right of the American Dental Association to originate new words as they may be required, and as the science of dentistry grows. Hardly any one would question the right of the American Medical Association to originate new medical terms, as it may see fit. Hardly any one would question the right of the American Roentgen Ray Society to formulate its own individual nomenclature. And so on all along the line. Not only is each separate science *expected* to adopt its own nomenclature, but when its literature crosses the borderline and steps into the realm of any other science, it is, in *honor bound,* compelled to use the accepted terms of that science.

Can you imagine the American Medical Association refusing to accept some dental term originated and adopted by the American Dental Association? Suppose this American Medical Association would object to the word "denture" and say that, in all their writings, the members must use the words "artificial teeth." Wouldn't that be a joke?

Now here, at this late day, comes this Committee (of the American Dental Association) on Dental Nomenclature, rendering a report, the meaning and intent of which is about as follows:

"Referring to the words used to designate a *dental X-ray negative,* we find that there are in use the following terms:

"Skiagraph, skiagram, radiograph, radiogram, and Roentgenogram. The first four terms are, of course, mongrel terms, as the American Roentgen Ray Society has adopted the word 'Roentgenogram.' The medical profession and *scientific dental writers* have adopted the word 'Roentgenogram,' there being *no other course for them to pursue,* and the Journal of the American Medical Association will allow the use of no other words on its pages.

"Notwithstanding these facts, we, the Committee on Nomenclature of the American Dental Asociation, in violation of all known codes of ethics, recommend that 'radiogram' be the accepted term, and the Dental Editors Club, of which your Chairman is a member, agrees to *allow the use of no other word by our contributors"* or words to that effect, and to its shame, be it said, the American Dental Association adopted the report. And dentistry is a science!

If all of this had not recently happened, one would say it could not have happened. And the worst of it all is that, right today, to the world at large, including dentists and physicians, the word "radiogram" means a message sent by radio, just as the word "telegram" means a message sent by wire.

The result of this is that, should a medical writer offer a contribution to a dental journal, in which article he uses the scientific term "Roentgenogram," when referring to *skiagraphs,* it cannot be accepted "as is." Wherever the word "Roentgenogram" appears, it will be scratched out and the word "radiogram" written in.

If a dental writer were to offer a paper to the Journal of the American Medical Association, wherever the word "radiogram," as authorized by the American Dental Association, was used, it would not be accepted, but it, in turn, would be scratched out and the word "Roentgenogram" inserted.

And dentistry is a science! What a sad commentary upon this science is the action of the American Dental Association in adopting the mongrel term "radiogram."

Within a few months, four papers of mine have been published in four different journals. In each of these papers I used the word "skiagraph."

One editor changed the word "skiagraph" to "Roentgenogram." While I regretted this, because the word doesn't "sound like me," I could not object because this is the accepted scientific term. The second editor changed it to "radiograph." The third editor changed it to "radiogram," while the fourth let it go "as was," for which I was thankful.

There is only one true and scientific name for that dental x-ray film, and that is "Roentgenogram." When any one presents a paper in which the word "skiagraph" or "radiograph" is used, no editor has any right whatever to change it to "radiogram." A writer is entitled to some rights after all. If the editors are not satisfied with the word used, they must change it to "Roentgenogram" and nothing else. That is the "rule of the road."

The American Dental Association and the Editors Club had better awaken to the fact that they have been side tracked, and, therefore, pull the sand lever, throw on the brakes, reverse gear, and back up onto the main line again; or in other words, rescind this foolish and unscientific act at the earliest moment possible.

As for myself, I cannot pronounce the word "Roentgenogram" half the time. I get all balled up with it.

Over twenty-six years ago, I had the privilege of taking the first dental *skiagraph* of a living subject, and I called it *"skiagraph,"* and everybody else called it a skiagraph, too, and I have taken thousands of *skiagraphs* since, and not being a scientific man, I hope to be still calling them skiagraphs when I "step off" to Mars, or some other unknown world. I will not change at this late day to "radiogram" when there is no good and valid reason for doing so, and, as I said before, "Roentgenogram" is too much for me.

THE TECHNIC OF ORAL RADIOGRAPHY

By Dr. Clarence O. Simpson, St. Louis, Mo.

(Continued from page 318.)

INTRAORAL EXAMINATIONS (CONTINUED)

Operation of Tube Stand.—The greatest efficiency and convenience cannot be obtained from the tube stand without a definite plan of operation. The weight essential for stability and balance in a tube stand offers considerable inertia, but the labor can be rendered negligible by systematic manipulation. By placing the tube stand slightly back of the chair on the side nearer the transformer, and turning the chair for the different regions, slight change in the location of the stand will be required for intraoral examinations. Placing the stand on the side nearer the transformer saves steps, since the angles should be calculated and the stand adjusted from the side of the chair on which the tube is located. This particularly applies to the mesiodistal angles, which can be best obtained by sighting along the cone.

Assuming that the tube stand is placed at the right of the chair, the right molar regions are radiographed with the chair in the customary position for clinical examinations. For the right canine regions, the chair is rotated about 45 degrees to the right, for the incisor regions 90 degrees to the right, and for the left canine regions 135 degrees to the right. For the left molar regions, the chair is rotated in the opposite direction 180 degrees to the left from the original position. With tube stands having an adjustment which changes the mesiodistal angle of projection, little turning of the head will be necessary, and uncomfortable poses will be avoided.

The approximate position of the chair and adjustment of the tube stand should be arranged before placing the film packet. To accomplish this, the position of the teeth in the region should be closely observed and the angle

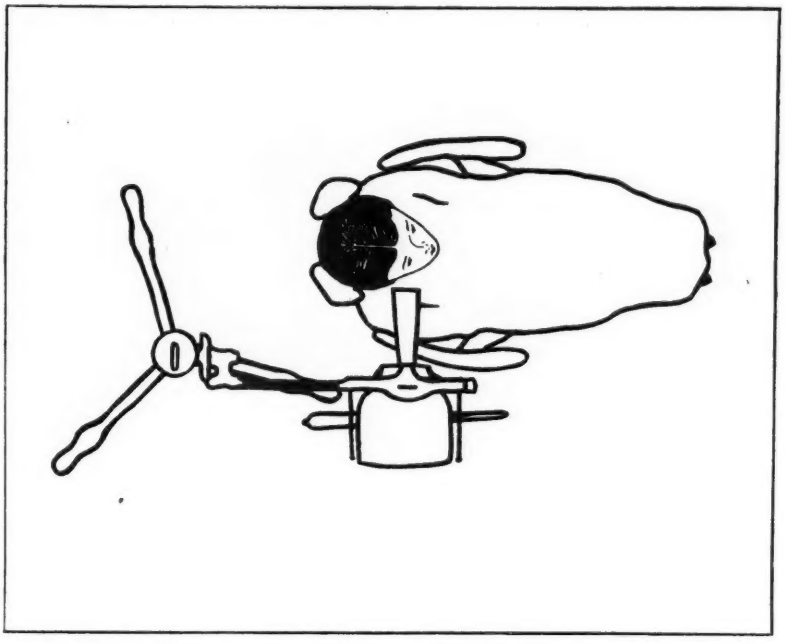

Fig. 1.—Position of chair and tube stand for right molar regions.

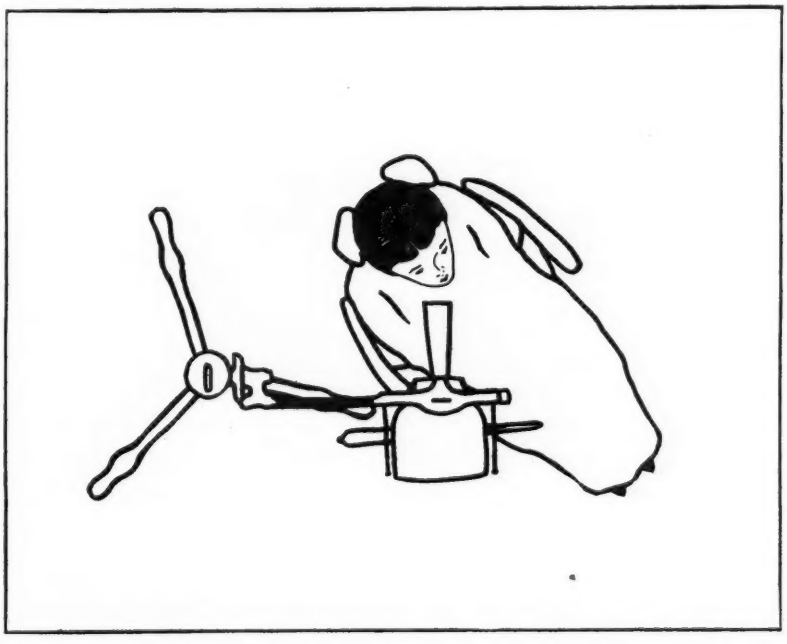

Fig. 2.—Position of chair and tube stand for right canine region.

of projection calculated, vertico-horizontally in degrees and mesio-distally in relation to dental landmarks. Then rotate the chair to the desired position, adjust the head rest so that the head is correctly posed, adjust the tube stand

for the vertico-horizontal angle and approximate mesio-distal angle, and swing the tube carrier aside to permit access for placement of the film packet.

Placement of Film Packets.—The position of the film packet establishes

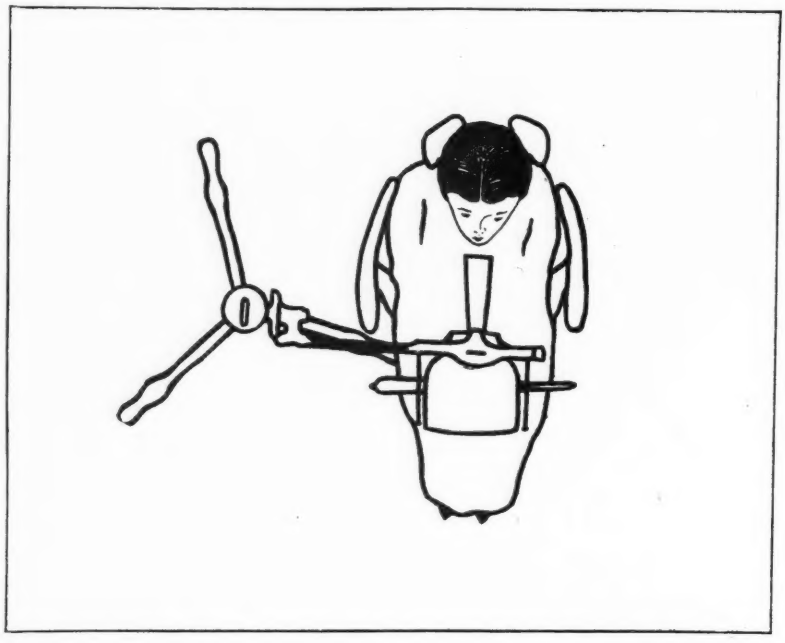

Fig. 3.—Position of chair and tube stand for incisor region.

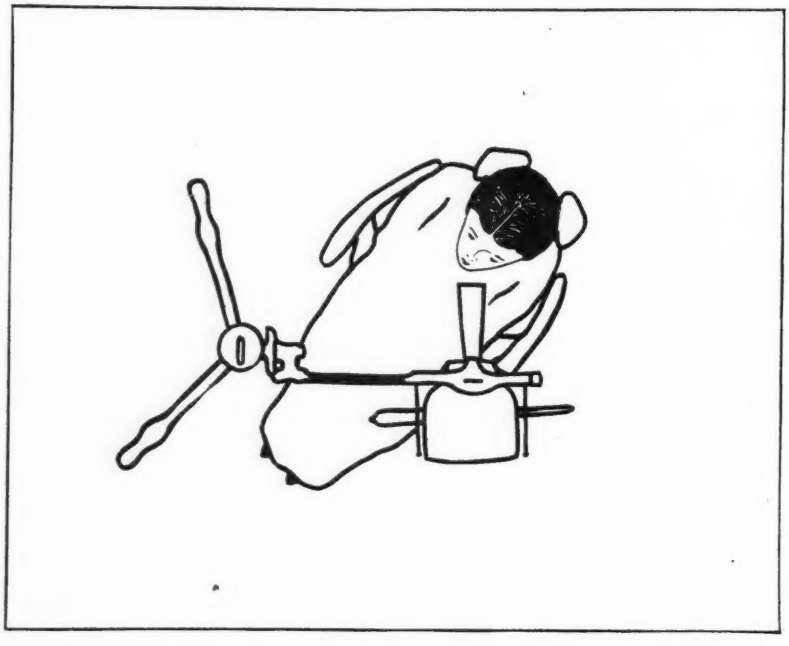

Fig. 4.—Position of chair and tube stand for left canine region.

the location of the image on the film. This is not a vital matter so long as the important structures are recorded, but it does determine the uniformity of the result and the proficiency of the operator. Excessively large areas

of distorted image with a wind-blown aspect or a grotesque placing of the image on the films, stamps the operator as a bungling novice, and is confusing to observers accustomed to uniform negatives. The method of inserting and adapting the film packets in the mouth, controls to a great extent the discomfort experienced by the patient, and the facility of the operation.

Having previously decided upon the position of the packet, the corner or corners which will encounter the most resistance are slightly bent to relieve the discomfort, and permit an easier adaptation of the packet. Excepting in the maxillary molar regions where nausea may be produced, the packets should not be placed by a single movement, but by three or more steps to gradually conform the packet and in the mandibular regions to

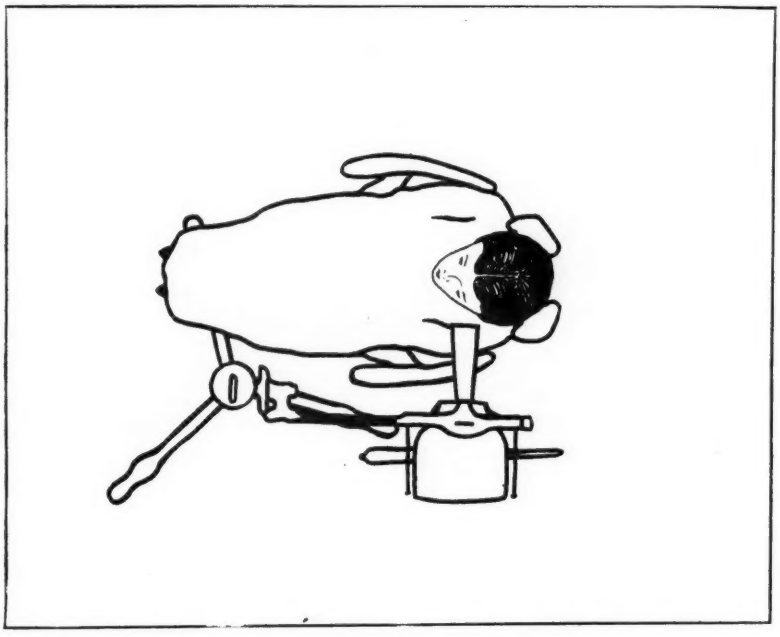

Fig. 5.—Position of chair and tube stand for left molar region.

displace the soft tissues. In adapting the film packets, they should be bent only enough to bring them into the closest possible relation to the roots of the teeth. Excessive bending is to be avoided, but when intraoral films are placed without bending, an objectionable space is left between the films and teeth and the plane of the films proportionately recedes from parallelism with the plane of the teeth. Theoretically a flat surface upon which to record the image is preferable, but in practice the advantage is overbalanced by the impaired definition in the negatives as the distance between the film and object is increased, and the altered aspect of a foreshortened view. Since a flat film cannot be placed so nearly parallel to the teeth as one slightly curved, the angle of projection must be more acute in relation to the roots, and the longitudinal view of the teeth and contiguous structures is usually the most valuable. Intentional distortion on the curved portion of the films

may be ignored in studying them but a loss of detail and an unfavorable aspect are serious handicaps in interpretation.

In placing the packet, cognizance should be taken of where the image of the teeth will be projected upon the films, that they may be shown in the negative and a symmetrical margin obtained. Since the film area should be utilized as fully as conditions permit, the incisal and occlusal line should be near the corresponding margin and approximately parallel to it. By so doing a liberal periapical region will be included, and the image of the teeth will be correctly placed. In this endeavor, consideration must be given to the angle of projection, the position of the teeth, the greater width of posterior teeth than incisors and canines, and the curve of Spee.

Retention of Film Packets.—Although many film holders have been designed for intraoral use, except in the mandibular molar regions none accomplishes the purpose better than digital retention. The thumbs are preeminently fitted to retain packets in maxillary regions, and the first fingers are most effective in mandibular regions. Since 98 per cent of people are right handed and the remainder are more nearly ambidextrous, the patient's right hand should be used for the left and median regions, leaving only the right regions for the left hand.

In the final adaptation of the packet, the first finger of the operator's hand opposite to that which the patient is to use for retention, should rest in the most advantageous location to retain the packet. Then place the first finger of the other hand alongside and in contact with the adapting finger to retain the packet while the adapting finger is replaced by the patient's finger or thumb. With the adapting hand, grasp the patient's retaining hand and carry the thumb or finger to the place indicated by contact with the operator's retaining finger, and demonstrate the amount of pressure required to prevent dislodgement of the packet. To avoid complications, never permit the patient to choose the location of the retaining finger or thumb, but always guide it to place.

After the patient's retaining thumb or finger is placed, a rest should be provided for the hand to aid in perfect retention. In maxillary regions where the thumb is used for retention, the fingers should be firmly rested near the temple. For mandibular regions where the first finger is used for retention, the thumb should press on the lower border of the mandible far enough from the film packet to carry the unemployed flexed fingers clear of the field.

Final Preparations.—After the packet is retained in position, observe the landmarks for the pose of the head, and make any changes indicated. In posing the head, the face should be firmly grasped with a hand on either side while the lip is retracted by the thumbs. Avoid touching the eyes or ears, because of the disagreeable sensation given the patient. Then swing the tube to place with care that the cone is centered on the region, make the necessary correction in the mesiodistal angle, and quickly proceed with the exposure.

(To be continued.)

RADIODONTIC RIDDLES

Conducted by Clarence O. Simpson, M.D., D.D.S.

A Department Devoted to Discussion of the Scientific, Technical, and Ethical Problems of Radiodontia

Why Say It with Flowers?

Q.—What are the standard terms for the common things in radiodontia? I am writing a paper on the subject for our state meeting, and want to choose the correct words from the many conflicting ones used by different writers.

A.—Your confusion is excusable, and you have illustrious company in Dr. Kells, the pioneer radiodontist, who in this issue appropriately remonstrates against the fad of opinionated nomenclature. Dentistry is inflated with rarefied atmosphere generated at every meeting by spellbinders who employ verbal bouquets to camouflage ordinary facts. Essayists who appear in dinner clothes before professional societies often have little information to impart. Dentistry is overdressed in operating environment for the requirements, and dental literature is overembellished with florid phraseology.

While not assuming the authority or responsibility as others (notably the Committee on Dental Nomenclature) have done in standardizing the nomenclature of radiodontia, the writer will tell you what he chooses and uses. The reason for use is that the terms have been generally accepted for years; they are expressive without ambiguity; they do not conflict with the rules of etymology more than the proposed substitutes, and there is no evident reason for revision.

"Radiology" is used as the science of radiant energy which includes x-rays, but refers to all the physical properties and should not be used interchangeably with radiography.

"Radiography" is used for the science and art of producing records of the radiability of substances by means of x-rays but does not include interpretation.

"Radiodontia" refers to that branch of dental practice devoted to the production and interpretation of radiographic records of the teeth and adjacent structures. "Oral diagnosis" is the correlation of clinical and laboratory data to determine conditions in the mouth and adjacent structures.

"Radiograph" is used as a noun for the record of the radiability of

interposed substances on a sensitive medium by means of x-rays. "Radiograph" is used as a verb for the act of producing a record of the radiability of substances. Do not be agitated about the dual use of "radiograph," for with other examples "photograph" is so used without confusion or objection. There is little occasion to use "radiograph" as a verb, since "radiographic examination" or "x-ray examination" is more descriptive of efficient service; and a less dignified term applies when it is only an inefficient mechanical procedure. "Radiogram" is affected by those who wish to appear distinctive, and may have no other claim to distinction.

Some hypercritical objection has been made to calling a radiograph a "negative," but since densities are reversed and the highlights and shadows correspond to those in photographic negatives, the term is accurately descriptive. Through a fluoroscope radiopaque objects appear dark, but when recorded in photographic emulsion they appear light and thereby suggest the term "negative."

The most careless or ignorant perversion of terms is the use of "x-ray" for everything pertaining to the science. Expressions such as the following are frequently heard: "So you are the x-ray man?" "Well I don't know much about x-ray, just bought my x-ray this year, but I wish you would look at this x-ray and tell me if the teeth ought to be pulled." "You know the doctors x-ray their patients now and order the teeth pulled, but they can't take a dental x-ray."

Since x-rays are not distinguishable by the senses, one cannot buy, look at, or take them, and the terms should be used only for the rays generated by the tube. We can buy an x-ray machine, view an x-ray negative, perform an x-ray examination, or learn dental radiography. X-rays may be "hard" or "soft," but they do not answer to "medical" or "dental," and "dental x-ray" signs suggest an advertisement of tinted doughnut-holes or beltless suspenders.

Dr. Kells rightfully protests because other words are substituted for "skiagraph" when his manuscript is published by different editors. When a man contributes original articles in words of his choice which are sanctioned by standard dictionaries, and later reads them transposed to "flapper" words of the editor's fancy, he resents the insolent display of authority. His contributions to this department were not corrected (?) to the sacred "radiogram" with which Dr. Dewey is infatuated, because the instructed proofreader was unfamiliar with "skiagraph" and probably thought it applied to astronomy. The writer avoids having "radiogram" forcibly injected into articles by using "negative," "image," "evidence," "record," etc., instead of "radiograph," and thus foils the editorial conspiracy.

"Radiogram" is distasteful because it was coined without reason except personal aggrandizement, as were "odontogram," "peridental lamella" and "pericementomata" by vocalists in capitalizing the work of others. "Radiogram" is confusing because of its having been previously adopted as the name for

a wireless message and the rapidly increasing utility of wireless communication demands the elimination of the term from dental nomenclature. It is significant that the men who are most prominently identified with the development of radiodontia do not subscribe to "radiogram," but it is those with only a "speaking" acquaintance and superficial interest in the subject who "parrot" it.

If anyone takes the reports of the American Dental Association Committee on Nomenclature seriously, he might question why it arbitrarily decides the terminology for the specialties of dentistry without consulting the specialists, or the special organizations. Assuming that according to custom, the chairman is responsible for the reports, he should not perform the duty as an autocrat and disdain counsel. One-third of the last report pertained specialists, or the special organizations. Assuming that according to customs, the American Society of Dental Radiographers for consideration. How is that for "railroading" by narrow gauge system? The American Revolution was caused by taxation without representation, and the House of Delegates has proved representative in name only, by unanimously adopting the report of the Committee on Nomenclature, and unanimously endorsing the "Dental Welfare Foundation."

The Roentgen terminology was foisted on the medical profession by the decrepit American Roentgen Ray Society to sustain its impulsively chosen name. One would question the etymological discrimination of a body with a name combining the paradoxical American Roentgen. This farcical pose of "honorary" nomenclature has been repudiated by the progressive Radiological Society of North America which is the representative organization of radiologists, yet the Nomenclature Committee endorsed the Roentgen prefixes. What is more ludicrous than a self-styled dental roentgenologist who does not speak the language?

Professor Roentgen deserves credit for the intelligence to recognize the manifestation of x-rays when he accidentally discovered them, and scientific proprieties permit the term Roentgen rays. Roentgen is not credited with a preconception of the phenomenon; he did not develop the apparatus which made the production of x-ray possible; he did not make the simple tests of the physical properties of his discovery which would have warned the subsequent martyrs of their peril, and the literature does not relate that he materially contributed to the advancement of x-radiation from a scientific curiosity to its present state of usefulness. So even if Dr. Kells ever learns to pronounce "roentgenogram," why be inconsistent and complex in the attempt to appear "highbrow"?

Even the "Jazzvertisers" are whitewashing the lily and perfuming the rose with a verbiage smoke screen, as the following quotation from advertising pages of the Journal of the American Dental Association illustrates.

"Radiographic Interpretation: At the apex of the first bicuspid there is a destruction of the stratum durum, and a locus of radiolucency, surrounded by a crescentic zone of radiopacity of apical hypoplasia. The pulp

canal is imperfectly filled. Diagnostic inference: postinfectious repair of an abscessed locus. (Interpretation confirmed by F. F. Molt, D.D.S.)."

* * * *

"Indications for Ultra-Violet: The highly bactericidal qualities of Ultra-Violet energy will insure a maintenance of sterility in the pathologic site. Ultra-Violet energy accelerates the calcium and phosphorus metabolism, which, in abscessed locuses appears as a stalactite accumulation represented by the crescentic radiopacity in the odontogram."

This is "copy" of a company which in the past has noticeably refrained from "bunk" publicity, and is transparently the delirium of a verbomaniac "pen-pusher" appropriating Dr. C. M. Sampson's physiotherapy clinical research. From an acquaintance with Dr. Molt since student days, it is conclusive that although he may have confirmed the evidence, even in the interest of publicity he did not so far forget his early training as to say those words.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Influence of Pregnancy on the Mouth. B. Hermann (Frankfurt am Main). Correspondent-Blatt für Zahnaerzte, 1922, Heft 4, vol. xlviii.

In summing up his long article the author states that both physiologic and pathologic alterations may be set up in the mouth by gestation. Caries stands in the first rank among these. Formerly the dentist dreaded extraction and even filling teeth in the gravid lest abortion result, but today no one heeds the old caution when any important step is to be taken. In fact the modern view is exactly opposite to the ancient, for pregnancy is the period which especially calls for dental services, because of the increased tendency to caries. Many make a rule of examining the mouth of the gravida every four weeks, so that new defects may at once be made good. But it is of course understood that the mouth must be in fairly good shape to begin with. If this is not the case only the most conservative management is in order during gestation. The gravida should be able to masticate her food properly but wholesale extractions and the fitting of dentures should naturally be attended to at the time of marriage or at least between pregnancies. even if pregnancy is no absolute contraindication. In regard to analgesia in connection with extraction, etc., many dentists use no special method for their pregnant patients, while others use some choice both in what to use and what to avoid. Adrenaline is feared by some on theoretic grounds, as the gravida is believed to be more sensitive to its action besides being naturally liable to a little glycosuria. Some dentists dislike to use cocaine on a gravida. Weak novocaine-suprarenin is preferred by certain dentists. General narcosis is seldom necessary.

Pyorrhea Alveolaris in Diabetics. H. Sieber (Brandenberg). Correspondenz-Blatt für Zahnaerzte, 1922, Heft 4, vol. xlviii.

A survey of the literature of this subject shows the existence of two opposing views. Thus for some physicians alveolar pyorrhea is a symptom of great importance in suggesting that the patient may be a diabetic, and it is claimed further that it is often the first objective symptom of that disease.

Others take a different viewpoint, holding that diabetes by causing an unsanitary state of the mouth provides a proper soil for the development of pyorrhea. All investigators express the opinion that pyorrhea is very common to diabetics.

The author having examined 32 sufferers from diabetes found that 78.1 per cent of this number showed alveolar atrophy, although the latter was both of pyorrheal and nonpyorrheal origin. Those free from alveolar atrophy were all under the age of forty. Apparently diabetes favors the development of both types of alveolar atrophy. In some patients the two forms could be made out side by side. The author made use of the Bang micromethod in pyorrhea cases to determine the amount of sugar in the blood and reached the conclusion that alveolar pyorrhea gives no special basis on which to suspect the presence of diabetes. There are numerous other severe constitutional affections which facilitate the development of that local disease.

Lichen Planus of the Buccal Mucosa. G. Thiebierge (Paris). La Reveue de Stomatologie, February, 1923, xxv, 2.

In an article entitled "Wilson's Lichen in the Mouth and Genital Organs" the author, a well-known dermatologist, calls the attention of the dentist to an affection which is prone to be mistaken for syphilis or leukoplakia buccalis, as a result of which blunder the patient may be improperly advised and treated and may also be frightened needlessly with the threat of cancer. When occurring on the skin the flat, angular papules of lichen planus have a dark red or brownish color, but not infrequently they are seen only in the mouth and beneath the foreskin, and on mucous membranes they present a whitish appearance which readily confounds them with mucous patches, leukoplakia or scar tissue. The condition per se is harmless. In any lesion within the mouth the dentist presumably looks for the possibility of lesions on the skin or at least asks about them and no confusion is likely if there is an eruption on the limbs. The author mentions the fact that these lesions may appear also on the tongue or lips although the inside of the cheeks is the preferred location for the isolated form. The simultaneous appearance of lesions in the mouth and on the penis suggests at times to the patient that he has a venereal disease; and if he has been exposed one should not hasten to tell him he is free from syphilis, but the latter point should be left to the Wassermann reaction. A little study will enable the dentist to recognize the nature of these white spots in the mouth by direct methods of diagnosis—the size and shape of the papules, their flat character and the little central depression being characteristic.

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EDITORIALS

Dentist Ninety-nine Years Old Dies

CLEVELAND, which will soon become the center of dental activities because of the American Dental Association Meeting in September, has had to stop and reflect upon the life of one of its pioneer dentists who died at the age of ninety-nine years, having practiced seventy years.

Dr. William Perry Horton, long known in dentistry as an energetic practitioner, and a citizen active in furthering the best interests of the community, was born in Pittsford, Vt., October 28th, 1823. He came to Cleveland in 1844, when this city was but eight years old, with about 10,000 inhabitants. He later attended Oberlin College, returning to Cleveland in 1851 and form-

ing a partnership with Dr. Benjamin Strickland, who had established himself as the city's first dentist in 1835.

Dr. Horton's active practice covered a period of nearly seventy years, which, perhaps, constitutes a record.

When the Northern Ohio Dental Association was organized in 1857 Dr. Horton became a charter member of it. He took an active part in the formation of the Ohio State Dental Society, becoming the first president of that organization.

In 1869 he was elected to the Cleveland city council from the old sixth ward and served for a period of eight years. He was also a member of the historic centennial council of thirty-six members.

Dr. Horton, formerly a Whig in politics, was one of the seven men who organized the Republican party. Years later he became a Progressive.

The widow, Mrs. Margaret Horton, three grandchildren and four great-grandchildren survive.

A Pioneer Dentist

THE American Dental Association which meets in Cleveland next September will honor the memory of one who was a real pioneer in dentistry.

Dr. Charles Richard Butler was a Cleveland product, and among the many Presidents of the American Dental Association, became one of the most noted dentists of his time.

His inventive genius and capabilities were shining examples of the qualities of those who pioneered their way into the fields that made dentistry a real profession.

Dr. Butler was born in 1832 and came to Cleveland in 1854 where he studied dentistry with Dr. William H. Atkinson and Dr. M. L. Wright. He also studied surgery with a noted surgeon, Dr. Elisha Sterling.

In 1858 he graduated from the Pennsylvania College of Dental Surgery, and the Cleveland Medical College in 1865.

He was the first Professor of Clinical Operative Dentistry in the country, the "chair" being created for him by the Ohio College of Dental Surgery in 1867. Here also he taught Steel Technics as he was an adept at handling steel. When he went to dental college in 1857 he took pluggers and excavators of his own manufacture and a mallet for condensing cohesive gold foil. He was called the "hammer and punch man." In 1860 he made a mallet of a cylinder of laurel-root filled with tin and lead melted together. The handle was of live oak taken from the battleship Kearsarge when it was dismantled. Before the dental engine was used (1868) he made a set of burs for cutting down fillings.

In 1868 he made a set of fifteen hand mallet pluggers; in 1878 another set of eight. He invented and made many excavators, chisels, and other instruments.

He was one of the finest operators, and being satisfied only with the best caused him to manufacture what was needed if it could not be purchased. This was true in many ways both in and out of dentistry. He became an expert in precious stones which were mounted with great skill in beautiful settings that he designed.

He was probably the first in Cleveland to give much of any attention to the "correction of irregularities of the teeth" in which he was successful.

Dr. Butler received many honors in his life and always was an honor to the trust that he held.

At Louisville, Ky., in August, 1888, he was elected President of the American Dental Association; was also President of the Ohio State Society, Northern Ohio Dental Association and Cleveland Dental Society. At the end of fifty-four years' practice he was given a complimentary dinner by many dentists from Cleveland and other places.

When the dental department of the Western Reserve University was organized in 1892, Dr. Butler was one of the organizers and its first Dean.

He was an indefatigable worker in the Methodist church, held many offices of trust in this and the Masonic bodies in which he was a distinguished thirty-third degree Mason. Dr. Butler was a friend of the young man in dentistry and was ever ready to lend him a helping hand.

Dr. Butler was born in Portage County, Ohio, in 1832 and died December 14th, 1914, aged eighty-two years. His funeral was conducted by the Knights Templar and a large concourse of friends.

(The writer is indebted to H. L. Amblers History of Dentistry in Cleveland for some of the above data.)

—*W. H. Whitslar.*

ORTHODONTIC NEWS AND NOTES

Dr. Calvin S. Case

Dr. C. N. Johnson, at a meeting of the Chicago Dental Society, held April 17, 1923, presented the following resolutions which were unanimously adopted:

WHEREAS, the members of the Chicago Dental Society having learned of the passing of one of its most distinguished and beloved colleagues, Dr. Calvin S. Case, and

WHEREAS, his many years of service to the profession and people in his chosen specialty had made his name synonymous with all that was progressive and scientific in its practice; and

WHEREAS, his sterling character and charming personality had endeared him to an ever widening circle of friends; therefore, be it

RESOLVED, That the Chicago Dental Society, in session assembled, wishes to place on record its appreciation of his outstanding ability and his many contributions to the science and art of dentistry and his generous helpfulness to those who sought his professional aid; also, be it

RESOLVED, That we give expression to our gratitude for the privilege of having labored with him for so many years and our profound sorrow that he has been taken from our midst.

American Society of Orthodontists

The Twenty-second Annual Meeting of the American Society of Orthodontists was held at the Edgewater Beach Hotel, Chicago, Ill., April 9, 10, and 11, 1923. The following program was carried out:

Monday, April 9, 1923

9:00 Meeting of the Board of Censors.
10:00 President's Address. By Burt Abell, Toledo, Ohio.
11:00 Business Session.
11:30 Case Reports.
No. 1. Charles R. Baker, Evanston, Ill. Brother and Sister Having Similar Malocclusion with Supernumerary Teeth Complications.
No. 2. George F. Burke, Detroit, Mich. Treatment of Class II Cases and Exercise that Aids in Their Retention.
No. 3. C. E. Byington, Chattanooga, Tenn. Correction of Class II and Class III Cases in Adult Life.
No. 4. George B. Crozat, New Orleans, La. Treatment of a Bilateral Distoclusion Complicated with Linguoversion of the Mandibular Teeth on the Left Side Posterior to the Canine.
2:00 The Relation of the Third Molar to the Development of the Mandible. By Chalmers J. Lyons, D.D.S., Ann Arbor, Mich.

3:30 Orthodontic Signs of Endocrine Disorders. By William Englebach, M.D., F.A.C.P., St. Louis, Mo.

5:00 Report of Committee on President's Address to Be Followed by General Discussion.

8:00 Physical Defects of Development and Anomalies of Character Formation in Children. By H. G. Matzinger, M.D., Buffalo, N. Y.

9:00 Case Reports:

No. 5. Lawrence W. Baker, Boston, Mass., Adelbert Fernald, Boston, Mass., and Fred R. Blumenthal, Boston, Mass. Report of Cases from Harvard Clinic.

No. 6. Bernard G. De Vries, Minneapolis, Minn. Some Unusual Cases and Their Treatment.

No. 7. G. Vernon Fisk, Toronto, Canada. Report of Neutroclusion Case, Having Extensive Root Movement, Treated with Half-round Pin Appliance.

Report of Progress of Case Having Bilateral Distoclusion, with Excessive Overbite, and Deeply Impacted Lower Right Canine, Being Treated with Half-round Pin Appliance.

Tuesday, April 10, 1923

9:30 When Radiography is Used to the Greatest Advantage in Orthodontia. By Clarence O. Simpson, M.D., D.D.S., St. Louis, Mo.

10:30 A Rational Treatment of Infra-occlusion Cases. By J. Lowe Young, D.D.S., New York City.

2:00 Some Observations in the Development of the Maxilla in Cleft Palate Cases. By M. N. Federspiel, B.S., D.D.S., M.D., F.A.C.S., Milwaukee, Wis.

3:30 Business Session.

4:30 Case Reports:

No. 8. A. C. Gifford, Oshkosh, Wis. Anterior Impactions and Why.

No. 9. B. Frank Gray, San Francisco, Calif. Class II, Division I, Complicated by Absence of Articular Process.

No. 10. Albert J. Hall, Ann Arbor, Mich. Impacted Cuspid and Impacted Central.

No. 11. Henry F. Hoffman, Denver, Colo. Report of a Case Showing the Conservation of a Developing Permanent Tooth in the Presence of a Cyst.

6:30 The Annual Dinner was held in the Black Cat Room of the Edgewater Beach Hotel, the guest of honor being Dr. Henry A. Baker. The ladies and guests were cordially invited.

Wednesday, April 11, 1923

9:00 An Efficient Record. By C. W. B. Wheeler, D.D.S., New York City.

9:30 Researches in Spring Wire Utilizing Original Physical Testing Apparatus. By Reginald V. Williams, Buffalo, N. Y.

10:45 Case Reports:

No. 12. C. C. Howard, Atlanta, Ga. Report of a Case of Acromegaly Demonstrating Its Place in the Etiology of Class III Cases.

No. 13. Allen Holman Suggett, San Francisco, Calif. Tricks of the Trade.

No. 14. Ralph Waldron, Newark, N. J. Neutroclusion and Distoclusion.

No. 15. Raymond J. Wenker, Milwaukee, Wis. Discussion of a Case of Surgical Orthodontia.

2:00 to 5:00 Clinics.

No. 1. Fred R. Blumenthal, Boston, Mass. Appliances, Attachments, and Auxiliaries.

No. 2. C. E. Byington, Chattanooga, Tenn. Stationary Lingual Loop Appliance, After 3½ Years of Proved Efficiency Showing Simplicity of Construction, Ease of Adjustment and Pleasing Results.

No. 3. Carl O. Engstrom, Sacramento, Calif. The Notation of Orthodontic Treatment.

No. 4. C. Sterling Conover, New York City. The Use of Overlays on Deciduous Molars in the Early Treatment of Deep Over-bite Cases.

No. 5. Adelbert Fernald, Boston, Mass. Lingual Lock.

No. 6. J. A. Gorman, New Orleans, La.

No. 7. Geo. W. Grieve, Toronto, Canada. Individual Bite Planes.

No. 8. Harry L. Hosmer, Detroit, Mich. Finger-spring Attachments to the Lourie High Labial Arch.

No. 9. Walter Hyde, Minneapolis, Minn. Case with Supernumerary Teeth, Before and After Treatment.

No. 10. Jos. E. Johnson, Louisville, Ky. A Simple Method of Predetermining the Dental Arch.

No. 11. Jesse F. Keeney, Quincy, Ill. Models and Methods of Taking Same.

No. 12. Harry E. Kelsey, Baltimore, Md. Rectangular Vertical Tube with Spring Post, for Attaching Lingual Expansion Arch to Anchorage.

Clamp for Holding Plaster Cast While Trimming.

No. 13. Wm. A. McCarter, Topeka, Kan. Removable Lingual Arch Showing Extension Lock Attachment.

No. 14. Oren A. Oliver, Nashville, Tenn. Soldered Lourie Lingual Arches. Removable Lingual Arches, Showing Cases and Actual Appliances Used in Treatment.

No. 15. Homer A. Potter, Kansas City, Mo. Tailor-Made Appliances—Direct Methods of Making Orthodontic Appliances of all Precious Metals, Showing Construction, Application and Model Results Obtained.

No. 16. Elizabeth E. Richardson, Berkeley, Calif. A Cast Splint with Wire Attachments for Elevating Impacted Teeth (Molars or Premolars).

No. 17. Frank C. Rodgers, St. Louis, Mo. Correction of Frenum-labii by Wire Extensions from an Appliance Fastened to the Teeth.

No. 18. Irving Spenadel, New York City. An Interesting Case of Cleft Palate from the Dewey Clinic.

No. 19. D. S. Sterrett, Erie, Pa. Respiratory Shield as Designed and Used by A. Leroy Johnson.

No. 20. Ralph Waldron, Newark, N. J. Uses of the Round Wire in Connection with the Angle Ribbon Arch.

No. 21. L. P. Bethel, E. G. Jones, Columbus, Ohio. Some Unusual Cases in Practice.

No. 22. Carl Engstrom, Sacramento, Calif. Notation of Orthodontic Treatment Using the Engstrom Record Card.

5:00 Closing Business Session.
Installation of Officers.

The Eastern Association of Graduates of the Angle School of Orthodontia

The Fourteenth Annual Meeting of the Eastern Association of Graduates of the Angle School of Orthodontia was held at the Hotel Vanderbilt, Park Ave., and Thirty-fourth St., New York City, May 7 and 8, 1923. The following program was carried out:

Monday, May 7, 1923

10:00 Therapeutic Measures Conducive to Bone Formation. By Alfred F. Hess, M.D., New York. N. Y.

11:00 Growth and Development of Italian Children in New York City. By John C. Gebhard, New York, N. Y.

2:00 The Process of Dentition and Its Effect on Occlusion. By Milo Hellman, D.D.S., New York, N. Y.

3:00 A Rational Treatment of Infra-Occlusion Cases. By J. Lowe Young, D.D.S., New York, N. Y.

4:00 Business Meeting and Election of Officers.

6:30 Dinner.

8:00 Explorations on the Coast of Peru. By Robert C. Murphy.

Tuesday, May 8, 1923

10:00 The Antiseptic Potency of Natural Acriflavine as Applied in the Practice of Orthodontia. By Henry C. Ferris, New York, N. Y.

11:00 Effects of Endocrine Derangement on the Teeth. By A. W. Crosby, D.D.S., New Haven, Conn.

12:00 President's Address. By Ira B. Stilson, D.D.S., Providence, R. I.

12:30 Announcement of the "Fanchard Celebration." By B. W. Weinberger, D.D.S., New York, N. Y.

2:00 Clinics:

New Rectangular Sheath, Angle-Atkinson Anchor Tube and Power Jack and the Tiny Arch and Smaller Bracket Bands, Representing the Newer Thought in Ribbon Arch Work. By L. E. Oesterle, Philadelphia, Pa.

Treatment of Class I. Cases Complicated by Deep Incisal Overbite. By Frederick C. Kemple, New York.

Individual Bite Planes. By George W. Grieve, Toronto, Canada.

Respiratory Shield. By W. H. Pearson, Norfold, Va.

Plaster Models of the Teeth Used in Teaching Normal Occlusion and Malocclusion. By J. A. C. Hoggan, Richmond, Va.

The Use of Overlays on Deciduous Molars in the Early Treatment of Deep Overbite Cases. By J. Lowe Young, New York.

CALVIN S. CASE, M.D., D.D.S., F.A.C.D.